To nudge or not to nudge: The effects of social identity on a nudge in reducing energy consumption

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Originality Statement

I, John Warwick, hereby certify that this thesis is my own original work. Any ideas, text or research referred to in this thesis which are not my own have been appropriately referenced. I also declare that this thesis has not been previously submitted for assessment.

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Abstract

Nudges have been a popular choice architecture tool in changing behaviour without restricting choices. The aim of this study was to examine if an anchor nudge with social influence could change intentions and motivations to reduce energy consumption. This study also investigated how social identity could impact the effectiveness of a nudge, in which shared identity (American) would create a greater change and an absence of shared identity (Canadian/Russian) would create a reactance towards reducing energy consumption. In both studies, participants read a hypothetical electricity bill, with a no nudge condition and three nudge conditions (nudge only, nudge with shared identity, and nudge with an absence of shared identity) comparing participants' energy use to average and efficient users. Study one (N = 380) utilised Canadians as an absence of shared identity and study two (N = 260) utilised Russians. Participants completed measures on general intentions, behaviour specific intentions, and motivation to engage with and recall energy saving strategies. As predicted, study one found a nudge on its own could change intentions compared to no nudge. As predicted, a nudge with shared identity was more effective in changing intentions compared to no nudge. Also as predicted, study two found highly identifying participants were more susceptible to a nudge with shared identity in changing intentions. With hypotheses partially supported, this study suggested that a nudge could cause subtle changes in intentions and behaviour. Furthermore, making shared identity salient could help increase the effectiveness of a nudge. However, this study found that nudges can have modest effects and are sensitive to sample size. Limitations and future research was also outlined.

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Climate change has become an increasingly prominent environmental, political, and economic policy issue. Governments and environmental organisations have proposed energy saving policies for environmental conservation, particularly focusing on carbon taxes and carbon emissions programs (Allcott, 2011). Though increasing taxes, public service announcements, and providing renewable energy information has assisted in energy conservation, they have been found to be costly, inefficient, and inconsistent (Allcott, 2011; Griskevicius, Cialdini, & Goldstein, 2008; Reiss & White, 2008). Consequently, there has been growing research on utilising persuasive behavioural science in increasing environmental conservation and decreasing energy use, particularly in households (Allcott, 2011; Costa & Kahn, 2013; John, 2011; Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007). One behavioural technique that has been frequently implemented is nudging, a cost effective persuasive tool in creating behavioural change that does not coerce or limit an individual's freedom of choice.

What is a Nudge?

Thaler and Sunstein (2009) defined a nudge as an aspect of choice architecture that influences people's choices without forbidding or restricting other options, such as changing their economic incentives. As an example, placing your desired choice at eye level is a nudge, banning alternative choices is not. Nudge thinking is consistent with liberal paternalism—it claims that public and private institutions can shape behaviour while maintaining freedom of choice. These institutions assume individuals make poor decisions and try to steer them to an alternative choice that will make their lives better. Due to this

thinking, nudges have been used in creating behavioural change in charitable giving (Richardson, John, & Cotterill, 2011), dental visits (Altmann & Traxler, 2014), organ donation (Richardson et al., 2011), and planning retirement superannuation (Clark, Maki, & Morrill, 2014).

In the United Kingdom, Prime Minister David Cameron's government created the Behavioural Insights Team (also known as *the nudge unit*) to use nudges in directing and promoting healthier lifestyle choices, increasing tax compliance and charitable giving (Mols, Haslam, Jetten, & Steffens, 2015). In Australia, the New South Wales government established a Behavioural Insights Team to form more effective policies (NSW Department of Premier and Cabinet, 2015). One of the most famous examples of a nudge is the urinal fly nudge at Schiphol airport in Amsterdam. A fake fly was placed in the men's urinals to give men a target to aim towards, which reduced spillage by 80 per cent (Thaler & Sunstein, 2009).

Nudges often rely on individuals not analysing particular situations and acting on them intuitively with very little effort. Strack and Deutsch (2004) and Thaler and Sunstein (2009) have stated that individuals have two modes of thinking: the reflective and automatic system. The reflective system includes more conscious, controlled and effortful thinking, whereby decision-making involves the weighing up of information and consequences. Initially, learning a second language or driving relies on reflective thinking. The automatic system relies on a less controlled and effortless process, with individuals often making rash decisions based on ambiguous information. This is due to humans wanting to select the path of least resistance, also known as inertia or status quo bias (John, 2011; Thaler & Sunstein, 2009). This distinction is largely consistent with

Amos Tversky and Kahneman (1974) research on heuristics and biases versus systematic processing. They suggest that individuals rely on heuristics to process judgements when presented with ambiguous information to achieve immediate goals.

There has been extensive nudge theory research that has demonstrated participants engaging in automatic decision-making. Rozin et al. (2011) utilised nudges within a cafeteria setting to encourage individuals to choose less calorie dense food, without altering or restricting their choices. The researchers predicted that proximity would affect food choices, in which food that was less accessible was less likely to be chosen than the more accessible food. In their numerous studies, the placement of ingredients such as chicken, cheese and broccoli was rotated on the middle or edge of a long rectangular salad bar. The results found that ingredients that were less accessible had a lower average selection rate than those placed on the more accessible rows. Similarly, Dayan and Bar-Hillel (2011) investigated whether an item's position on a menu could nudge people into selecting that item. They investigated whether middle bias was more effective than first and last bias in menu selection. However, the experimental and field studies they conducted found that items were more likely to be selected when listed first or last on a menu.

As previously demonstrated, nudges cover a wide range of behavioural techniques. The study by Momsen and Stoerk (2014) examined a number of nudges in changing individuals' intentions to participate in renewable energy. In this study, participants were asked to imagine themselves moving to a new neighbourhood and had to select buying conventional energy or buying 50% conventional and 50% renewable energy at a higher cost. Participants in the

control condition were only presented with this decision. Participants in the treatment conditions were exposed to one of nine different nudges. The nudges in this study were priming (recalling information about climate change), mental accounting (refilling ethical mental account by participating in renewable energy), framing (emphasising on gains or loses of carbon emissions), decoy (irrelevant alternative to make target alternative more favourable), social norms (feedback information about the behaviours of others), and default (renewable energy preselected to avoid effort - loss aversion). The results of this study found that some nudges such as priming, social norms, and default had influenced participants' decision in choosing renewable energy compared to control. In contrast, some nudges such as mental accounting and framing had a negative effect in selecting renewable energy. These results suggested that implementing particular nudges could create change in participating in environmentally sustainable behaviour compared to when a nudge is not present. Furthermore, this study demonstrated that particular nudges could have negative effects when changing particular intentions and behaviours.

Unlike the Momsen and Stoerk (2014) study, this thesis will focus and elaborate on the anchoring and adjustment nudge, a heuristic listed by Thaler and Sunstein (2009) and Amos Tversky and Kahneman (1974). During the decision making process, individuals use an initial piece of information as a starting point (anchor) and adjust their behaviour in the direction they deem as appropriate from that anchor. Individuals often align their behaviour closest to the anchor. Wansink, Kent, and Hoch (1998) found that when shoppers were given a quantity anchor ("buy 6 cans for $3" instead of "buy one can for 50

cents"), they made upward adjustments and purchased more cans to align their behaviour to match the anchor nudge they were provided.

Previous energy conservation interventions have utilised anchoring and adjustment nudges in reducing energy consumption. The anchor in these studies is normally the recommended kilowatts per hour (kWh) households should use per month (Allcott, 2011; Ayres, Raseman, & Shih, 2013; Costa & Kahn, 2013; Schultz et al., 2007). If they use more energy than the anchor, they may make a downward adjustment. If they use less energy than the anchor, they may make an upward adjustment (Schultz et al., 2007). However, these anchor nudges are often guided by social influence, in which the recommended kWh is displayed as the energy use of more energy efficient households. These social influences can guide the nudge's effectiveness and direction.

Nudges With Social Influence

Social influence occurs when an individual's beliefs and behaviours are affected by the actions of others (Cialdini & Goldstein, 2004; Deutsch & Gerard, 1955). Deutsch and Gerard (1955) have stated that there are two types of social influence: normative social influence, when there is a need to conform to the positive expectation of others; and informational social influence, when there is a need to accept information from others as reality. Social influence can often be seen in conformity (Asch, 1955) and peer pressure (Borsari & Carey, 2001; Goode, Balzarini, & Smith, 2014). Asch's conformity experiments are classic examples of social influence, in which people's judgements change to align with the group's judgements, even if the group is wrong and were unfamiliar (Asch, 1952, 1955). Studies by Schultz, Khazian, and Zaleski (2008) and Nolan, Schultz, Cialdini, Goldstein, and Griskevicius (2008) have found that

individuals will change and align their behaviour when presented with information about another social group's behaviour.

The study by Schultz et al. (2007) examined how social influence could impact the effectiveness of an anchor nudge. In this study, households were given a home electricity report that compared their energy use to other households in their community. Households with either higher or lower energy consumption than the community average were randomly allocated to receive either only descriptive norms information (anchor nudge with social influence) or descriptive plus injunctive norms information (injunctive norm were manipulated by either a happy face or sad face). The results aligned with their predicted hypotheses, in which households who were using above average energy reduced their energy consumption when provided with a descriptive norms nudge. Those who had lower than average energy consumption increased their consumption when only provided with descriptive norms, but maintained a low energy consumption rate once provided with an injunctive norm when they went above the average consumption. Furthermore, the researchers found that social influence was still present 4-weeks after the initial intervention. This study demonstrated the effectiveness of environmental anchor nudges in changing behaviour. Households tried to align their behaviour to match the anchor nudge they were provided. Furthermore, it is suggested that social influence can effect the direction of the desired target behaviour. This resulted in some households using more energy to match the community average, causing an unintentional reactance effect.

A subsequent study by Goldstein, Cialdini, and Griskevicius (2008) examined if meaningful social influence could affect an environmental nudge.

The researchers hypothesised that a social norms nudge would be more effective in towel reuse compared to instructions to reuse towels. In their first experiment, the researchers left either industry-standard information pamphlets (information stating to save the environment) or a social norms nudge about the towel use behaviour of previous hotel guests. The nudge informed hotel guests that a majority of other guests reused their towel. The results from the first experiment supported their hypothesis, in which social norms prompted more towel reuse. In the subsequent experiment, different social norms nudge conditions were given a reference group identity, which included previous hotel guests (*75% of the guests participated in our new resource savings program by using their towels more than once*), previous guests in that specific room (*75% of the guests who stayed in this room (#xxx) participated…*), identity of being a citizen (*You can join your fellow citizens in this program to help save the environment by reusing your towels during your stay*), and the gender identity (*76% of the women and 74% of the men participated…).* The results of the second experiment found that the social norms nudges with reference to group identity were more effective in towel reuse compared to the industry standard information. Furthermore, they found that same room identity (previous guests who stayed in the same room) yielded significantly higher towel reuse than the other reference group identities. Goldstein et al. (2008) is another example of social influences affecting the effectiveness of a nudge. They found that pairing a meaningful reference group could make a nudge more effective, as it made identification more salient. This is supported by previous social influence research by Festinger (1954), Terry, Hogg, and White (1999), and White, Hogg,

and Terry (2002) who have found that individuals are more likely to follow the behaviour of others who share similar characteristics.

The Schultz et al. (2007) and Goldstein et al. (2008) studies have demonstrated how social influence can impact the effectiveness of a nudge in changing towards environmentally sustainable behaviour. Furthermore, Goldstein et al. (2008) found that when meaningful social influence is made salient, it could increase the effectiveness of a nudge. Thaler and Sunstein (2009) have argued that individuals have an inherent “herd mentality” and can easily conform to the behaviour of others. However, studies by Oldmeadow, Platow, Foddy, and Anderson (2003) and Whitmarsh and O'Neill (2010) have suggested an individual’s social group or identity can affect and direct their change in behaviour and may not conform so easily to a nudge. Individuals may also react against a nudge or persuasive message, as its limits their freedom or is against their social identity.

The study by Costa and Kahn (2013) examined how political ideology could influence a nudge’s effectiveness in reducing energy consumption. Similar to the Schultz et al. (2007) study, Costa and Kahn (2013) nudged households in reducing their energy consumption with information about the energy use of their neighbouring households. However, Costa and Kahn further built on Schultz et al. (2007) research by examining if political ideology could influence an anchor nudge with social influence. Previous research found that liberals highly identified with conserving the environment, whereas conservatives are often against it (Kahn, 2007; Kotchen & Moore, 2008). Making environmental conservation salient may affect household energy use behaviour, as households would perform the behaviour that aligns with their

identity and political ideology. While liberals are more likely to be affected by the nudge, conservatives may not attempt to reduce their electricity, or even use more when presented with a nudge that is against their political identity.

In their study, households were presented with a Home Electricity Report letter (HER), which compared their energy consumption relative to their neighbour's consumption over the same period. This comparison was displayed as a bar graph comparing the target household's energy use with their average neighbours and efficient neighbours energy use. Treatment households also received injunctive-style norms labelled as "great," "good," or "room for improvement." The selected houses were matched with their political party registrations to gain political ideology information. A control and treatment group were monitored over an approximate 2-year period.

As predicted, they found that most households who were given an anchor nudge reduced their energy consumption compared to control, with liberals reducing their energy consumption more than conservatives. Both liberal and conservative households reduced their energy use when given the "room for improvement" message. However, when given the "good" message, conservatives increased their consumption, where as liberals decreased their consumption. This demonstrated a reactance or boomerang effect, which also aligned with their prediction. It was predicted that conservatives would react against the nudge because of their political identity and their in-group beliefs about the environment and climate change.

A reactance may occur if the individual does not highly identify with the salient group or behaviour (McGarty, Haslam, Hutchinson, & Turner, 1994; Mols et al., 2015). Reactance theory has stated that individuals react in the

opposite behaviour as they feel their perceived behavioural freedom is threatened (Brehm, 1966). Previous studies have also found a reactance against a persuasive message due to the content of the message making their identity or behaviour salient (Dillard & Shen, 2005; Grandpre, Alvaro, Miller, Burgoon, & Hall, 2003; Rains & Turner, 2007).

These previous studies by Costa and Kahn (2013), Goldstein et al. (2008), and Schultz et al. (2007) have demonstrated that social influence can affect a nudge and the direction of household energy consumption. Furthermore, a nudge can make an individual's identity salient, which can impact a nudge's direction and power. If an individual identifies with the nudge, they are more likely to engage with the desired behaviour than a nudge on its own (Costa & Kahn, 2013; Goldstein et al., 2008). If an individual does not identify with the nudge, it may not be as effective or can cause a reactance against the desired behaviour (Costa & Kahn, 2013; Grandpre et al., 2003) In the Costa and Kahn (2013) study, political ideology was only observed and not controlled for. However, controlling for and understanding social identity may assist in making nudges a more effective persuasion tool in creating behavioural change.

There is current literature that critiques the effectiveness of nudges, stating a nudge on its own is not enough to make long term behavioural change (Mols et al., 2015; Richardson et al., 2011). Marteau (2011) and Mols et al. (2015) have argued that nudges can have modest impacts and are not enough for lasting behavioural change. Goldstein et al. (2008) study demonstrated that a singular nudge is weaker compared to other nudge conditions that incorporated social influence and made reference to social groups. Costa and

Kahn (2013) study demonstrated the presence of intergroup processes, in which liberal individuals who identified with energy conservation were more susceptible to the nudge. Conservatives, who do not identify with energy conservation, avoided participating in out-group behaviour by using more energy and not participating in energy saving activities. Mols et al. (2015) have suggested that a social identity approach can be used not only as a social influence tactic, but also in combination with a nudge. Social identification is important to manipulate and control to ensure a nudge's effectiveness is more impactful and in the desired direction. More specifically, intergroup processes (in-group versus out-group) will be one aspect of social identity that will be examined and implemented in this thesis.

Social Identity

Social identity can be explained from two social psychological theories, social identity theory (Tajfel & Turner, 1979) and self-categorisation theory (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). Both theories are collectively known as the social identity approach. These theories draw from the concept of intergroup processes, in which an individual's perception of him or her self is relative to their social context and their perceived membership towards particular social groups (Hogg & Abrams, 1988). Social identity theory focuses on how an individual's behaviour is guided by their perception as an individual (personal identity) and as a member of their social group (social identity) (Mols et al., 2015; Turner et al., 1987). Through social comparison, an individual can categorise himself or herself as a member of a social group whose members share similar traits to them. This group is labelled as their in-group (Stets & Burke, 2000; Turner et al., 1987). In contrast, an individual who

perceives members of another social group as different is labelled as an out-group. When categorising themselves as part of their in-group, individuals aim to incorporate the group's expectations, beliefs, and behaviours as their own. This creates a sense of belonging and uniformity between the individual and their social in-group (Stets & Burke, 2000). Making group membership salient can influence an individual to act on goals and desires as member of their social group, rather than their own personal goals and desires as an individual (Stets & Burke, 2000; Turner et al., 1987).

Salience can activate an individual's identity in particular situations to increase the influence of their social group's behaviours and beliefs (Stets & Burke, 2000). Salience is influenced by the accessibility and fit of a social group (Oakes, Haslam, & Turner, 1994). Accessibility is how prepared a social group can be activated in particular situations. Fit comprises of two concepts, normative fit and comparative fit. Normative fit is when an individual perceives stereotypical characteristics of social groups as normal. Comparative fit is when an individual perceives the similarities of their in-group members and differences from their out-group members.

When in-group membership is made salient, an individual may alter their behaviour to align with their in-group to maintain shared identity, group norms, and expectations. This process is known as depersonalisation (Turner et al., 1987). When engaging with depersonalisation, an individual acts in accordance to the group's behaviour, rather than their own. By enhancing the evaluation of their in-group compared to the out-group, it concurrently enhances an individual's self esteem and self evaluation, as they are a group member of the highly valued social group (Stets & Burke, 2000). This confirms their social

identification with the group. Previous studies by Greenaway, Wright, Willingham, Reynolds, and Haslam (2015) and Jain, Gulbinas, Taylor, and Culligan (2013), have demonstrated the importance of identifying the in-group identities in creating behavioural change. Participants are more likely to perform the desired behaviour when in-group membership is made salient.

When out-group membership is made salient, an individual may react against the nudge or persuasive message that is presented (Mackie, Worth, & Asuncion, 1990; McGarty et al., 1994). Oyserman, Fryberg, and Yoder (2007) found that intergroup processes could influence healthy behavioural choices. This study found that ethnic minority groups (African American, Mexican American, Native American) were less likely to engage with health promotion behaviour, as they identified healthy behaviour to the white middle class out-group. When presented with a list of healthy behaviours (eat salad, exercise daily), ethnic minority groups were less likely to engage with the desired healthy behaviour and engaged more with unhealthy behaviour. Ethnic minority groups found that health promotion challenged their identity, as they identified unhealthy behaviour (drinking soda, smoking) as in-group attributes. This study demonstrated comparative fit, as the similarities and differences of social groups are made salient by the health promotion stimulus. McGarty et al. (1994) found that participants were less likely to engage with a persuasive message to drive safely when an out-group member presented it. In contrast, they were more persuade when the messages was delivered by an in-group member.

Lewis and Neighbors (2007) examined whether a nudge's effectiveness could be influenced by social identity in reducing alcohol consumption,

specifically gender. In this study, participants' were exposed to a social norms nudge that compared their alcohol consumption to the actual alcohol consumption on campus. Participants either received a gender-specific feedback *("This is how much the typical female student actually drinks"*), gender-neutral feedback *("This is how much the typical student actually drinks*"), or a control condition. Participant's baseline measures (alcohol consumption, gender identity) were compared to a one-month follow up. The results found that the social norms nudge was more effective in reducing alcohol consumption compared to the control condition. Furthermore, the study found that specifying gender identity was more effective towards women who highly identified with their gender. This study demonstrated the importance of pairing and manipulating social identity with a nudge. Participants who highly identify with the salient reference group are more susceptible to a nudge. This study has demonstrated that making shared identity salient could influence and change behaviour more effectively.

There have been social identity focused campaigns that have demonstrated lasting behavioural change. The Sun-Smart campaign by the Victorian Cancer Council associated sun safety with the Australian identity by associating the practice of sun safety as an Australian characteristic. This allowed individuals to gain a new self-understanding and internalise the new norm (Mols et al., 2015; Montague, Borland, & Sinclair, 2001). By participating in the new norm of sun safety, everyday Australians were able to maintain a shared identity with their in-group members. This resulted in a reduction of skin cancer incidences and the slogan "slip, slop, slap" being an integral part of Australian culture (Mols et al., 2015; Montague et al., 2001). This campaign

was not only successful during the 1980s when it was initially implemented, but has become a successful campaign into the present day. Social identity is an important factor to consider when creating behavioural change. Furthermore, a nudge that makes use of shared identity salient could become more effective and could create longer lasting behavioural change (Mols et al., 2015).

The Current Study

Previous literature has demonstrated that nudges can have a subtle and effective impact on creating behavioural change. Anchor nudges with social influence have been a common tool in reducing household energy consumption (Costa & Kahn, 2013; Schultz et al., 2007). Furthermore, intergroup processes can influence the impact and direction of these nudges. If an individual has a shared identity with the behaviour, they are more likely to change and maintain the desired behaviour (Costa & Kahn, 2013; Lewis & Neighbors, 2007). If an individual does not have shared identity with the behaviour, they may react against the behavioural change (Costa & Kahn, 2013; Oyserman et al., 2007). This study will build on previous critiques that a nudge on its own is not enough in creating significant behavioural change and that incorporating social identity may increase a nudge's ability to create behavioural change (John, 2011; Mols et al., 2015). This study used similar anchor nudge techniques in the Costa and Kahn (2013) and Schultz et al. (2007) studies, in which participants' consumption were compared to the consumption of others. Similar to the Lewis and Neighbors (2007) study, this study made shared identity salient, but built on this research by making the absence of shared identity salient. For the first time, this was a systematic analysis of the shared identity and absence of shared identity hypotheses.

The aim of this study was to examine if a nudge could change the intentions to engage in reducing energy consumption in the household. Furthermore, this study investigated the impact identity had on the effectiveness of the nudge. It was anticipated that nudges that utilise shared identification would enhance the effectiveness of a nudge. In contrast, nudges that relied on out-group comparisons would be less effective because they evoked reactance. This study also investigated whether nudges with shared identity would have a greater impact on those who highly identified with that shared identity.

Two studies were conducted and in both studies, participants were randomly allocated to one of four conditions: 1. Nudge only condition – participants' electricity bills only had an anchor nudge with social influence; 2. Nudge with shared identity (in-group) – participants' electricity bill had an anchor nudge with reference to in-group members (i.e., Americans); 3. Nudge with an absence of shared identity (out-group) – participants' electricity bill has an anchor nudge with reference to out-group members (Study 1 – Canadians, Study 2 – Russians); 4. No nudge condition – participants' electricity bill stated only their own use, with no nudge present. Participants in this study were given a hypothetical electricity bill that compared their energy consumption relative to other comparable households. Participants' hypothetical energy use was always above the average energy use of others.

The main dependent variables in this study included general intentions (i.e., how much participants intend on changing their energy use) and behaviour specific intentions (i.e., how much participants intend on changing specific environmental behaviours). Intentions were measured in this study, as there

was not enough time or resources to access energy consumption behaviour in households. The theory of planned behaviour (Ajzen, 1985) has stated that intentions are an immediate antecedent to behaviour. The stronger the intention to engage with the behaviour, the more likely the behaviour will be actioned (Ajzen, 1991). Momsen and Stoerk (2014) also found that nudges impacted participants' intention to select renewable energy use. The amount of time (in seconds) participants spent reading a brochure that included strategies of how to reduce energy consumption in the house and how many strategies participants were motivated to recall were also measured. We assumed that the longer participants took to read the brochure and the more correct strategies they recalled, the more motivated they were to reduce their energy consumption (Roebers, Moga, & Schneider, 2001; Verplanken, Jetten, & Knippenberg, 1996). To examine support for hypothesis three, identification with in-group and out-group members were measured.

Study one and study two tested the same three hypotheses:

1. Compared to a no nudge condition, a nudge only condition should significantly increase general intentions and behaviour specific intentions, and enhance motivation to engage with and recall energy saving strategies.

2. Identity based nudges should change the effectiveness of a nudge. A nudge making use of shared identity should be more effective in changing general intentions and behaviour specific intentions, and enhance motivation to engage with and recall energy saving strategies than a no nudge or nudge only condition. In contrast, nudges that aim to engage people through making use of out-group identities should trigger a reactance and this should cause less

intentions to change and greater resistance to engage with energy saving strategies than the no nudge and nudge only condition.

3. Nudges with shared identity should be most effective in changing general intentions and behaviour specific intentions, and enhance motivation to engage with and recall energy strategies when participants highly identify with that shared identity.

Study 1

The aim of study one was to examine if a nudge could change the intentions to engage in reducing energy consumption in the household. This study will test the three hypotheses that were previously outlined. Study one examined responses to a sympathetic out-group comparison (Canadians) that did not differ greatly from the target participants' identity (Americans).

Method

Contributions

My supervisor and myself jointly designed both studies for this project. I designed and created the stimulus and questionnaire on Qualtrics. My supervisor sourced the participants through MTurk. Data analyses (cleaning data set and running statistical analyses) were done by myself, but received statistical analysis assistance from my supervisor.

Participants

Participants were 459 Mechanical Turk (MTurk) workers. Participants with incomplete data (less than 50% completed) were deleted. Participants were given manipulation checks to test if they comprehended the manipulations correctly (*Did you use more, the same, or less than the average user; did you use more, the same, or less than the efficient user).* We deleted 31 participants

that incorrectly indicated that the bill stated they used less or the same than the comparison energy users. The final data set included 380 participants. The sample's age ranged from 18 to 75 (*M* = 33.63, *SD* = 11.46), with 193 male participants (50.79%). There were 98 participants in the nudge only condition, 105 in the nudge with an absence of shared identity condition, 97 in the nudge with shared identity condition, and 80 in the no nudge condition.

Design

The study was a between-subjects design, in which participants reviewed a hypothetical electricity bill. The study was created on Qualtrics, through the School of Psychology server. The electricity bill was designed using Microsoft Excel and Adobe Photo Shop. Before starting the experiment, participants read an information sheet about the study and consented their participation (Appendix A). Participants were asked to imagine being a homeowner of a US metropolitan city apartment and they were asked to review their electricity bill for the month. In all conditions, the participant's energy use was listed as 1902 kWh. In the three nudge conditions, the average users' energy use was listed as 1626 kWh and the efficient users energy use was 635 kWh. The hypothetical kWh numbers used in this study were the same as the kWh used in Costa and Kahn (2013) study. All four electricity bills looked identical, except for the manipulated shared identity information in the three nudge conditions (Figure 1). Participants were randomly allocated to one of four conditions:

1. Nudge only – participants were informed that their bill would compare their energy use to comparable households. The graph displayed their energy use as higher than that of the *average user* and the *efficient user*.

2. Nudge with an absence of shared identity – participants were informed that their bill would compare their energy use to households in Canada. The graph displayed their energy use higher than that of the *average Canadian user* and the *efficient Canadian user*.

3. Nudge with shared identity – participants were informed that their bill would compare their energy use to households in the United States. The graph displayed their energy use higher than that of the *average American user* and the *efficient American user*.

4. No Nudge – participants were only provided with their energy use for the month, without any comparison to other users. Their bill stated their energy use for the month in text.

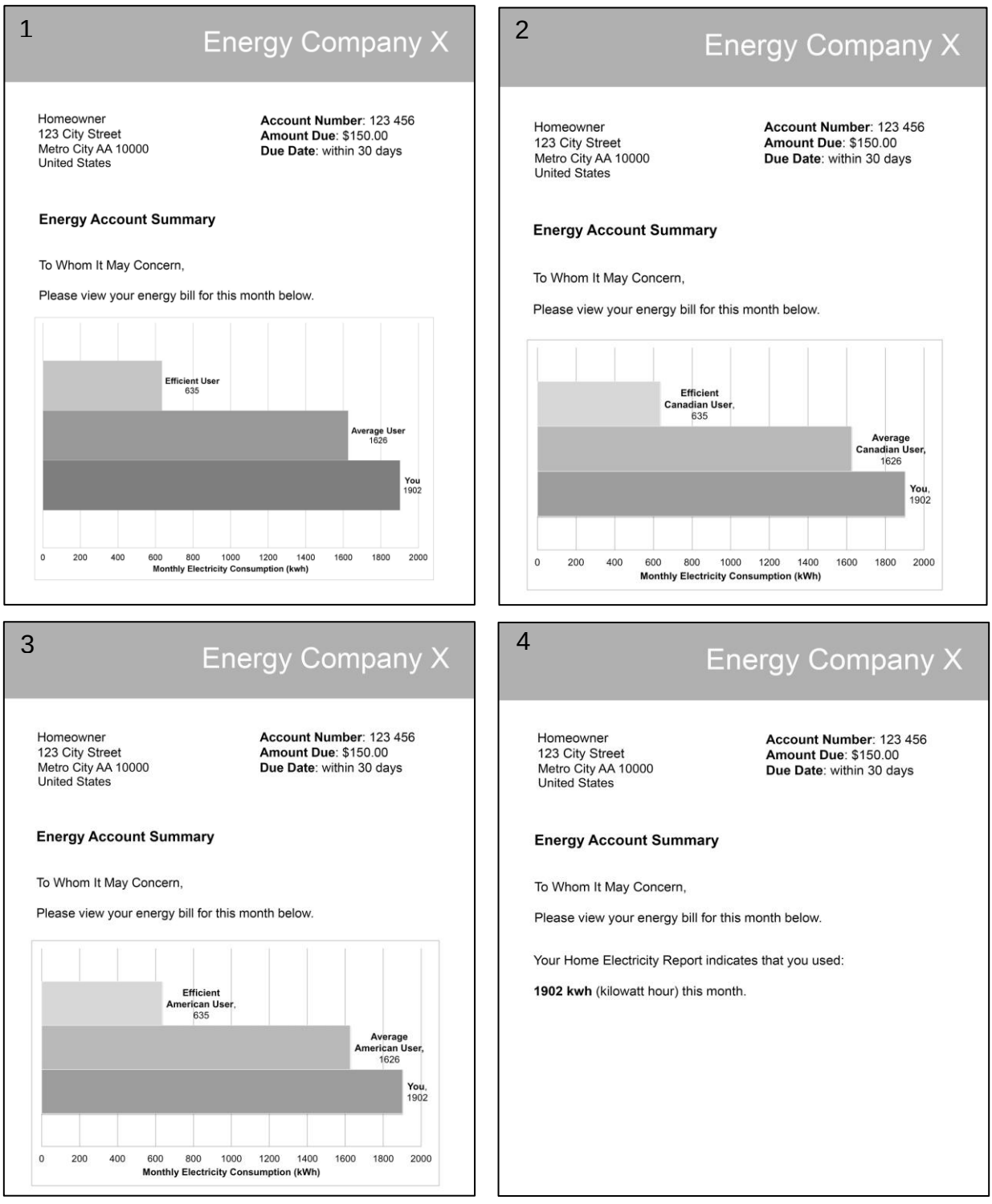


Figure 1. Electricity bill conditions (L-R): 1 - nudge only; 2 – nudge with absence of shared dentity; 3 – nudge with shared identity; 4 – no nudge

Dependent Measures

Participants were asked to complete four subsets of items. All responses were recorded on a 7-point Likert scale ranging from strongly disagree (1) to strongly agree (7) (Appendix B).

Three items measured general intentions to become a better energy user. In particular, participants had to indicate their agreement with the statements: *I intend on reducing my energy consumption in the next week, In the next week, I will strive to become more like the efficient energy user, In the next week, I will strive to become more like the average energy user*. Cronbach's alpha was .81.

Ten items were included to measure behaviour specific intentions in relation to the upcoming week (*In the next week, I will take shorter showers to conserve water, In the next week I will not be interested in trying to conserve energy)*. These questions were adapted from the Environmental Attitudes Inventory – Personal Conservation Scale (Milfont & Duckitt, 2010). Cronbach's alpha was .92.

Four items were included to assess identification with the American in-group (*I identify with people who live in the United States*) and the two items were asked with reference to the Canadian out-group, *(I identify with people who live in Canada, I feel committed to people who live in Canada).* These questions were adapted from the four Item Social Identification scale (Postmes, Haslam, & Jans, 2013). Cronbach's alpha for American identification was .88 and Canadian identification was .90.

Participants were then asked to read an energy savings brochure. This brochure showed 13 practical ways they could save energy in their actual

home. The energy savings brochure was retrieved from the South Australian government website (Government of South Australia, 2015) and was selected as it clearly listed and displayed relevant energy savings strategies (Appendix C). The time spent reading this brochure was measured in seconds and was assumed to be an indication of motivation to engage in more environmentally sustainable behaviour. Higher reading times are an indication of more motivation and engagement (Verplanken et al., 1996).

Participants completed demographic information including their age, gender, nationality, ethnicity, and how many people are in their household (Appendix D). After completing demographic information, participants were directed to another question asking them to recall as many energy saving strategies listed in the brochure that they could remember. The more correct strategies that were recalled, the more motivation participants had in remembering energy saving strategies (Roebers et al., 2001). Energy strategies that were listed correctly were counted and were coded 0 – 13 by the researcher, with 0 (zero) being no correct answers and 13 being all correct answers. After completing this task, participants were directed to a debrief page and were given a validation code for payment (Appendix E).

Results

Testing Support for Hypotheses 1 and 2

To examine support for hypotheses 1 and 2, a series of one-way analysis of variance (ANOVA) were performed to examine the effects of the four conditions on general intentions, behaviour specific intentions, and motivation to engage with and recall energy saving strategies. To reduce error variance, the same analyses were performed controlling for American and

Canadian identification. Means, standard deviations and p values are presented in Table 1.

General intentions. There was a statistical effect of condition on general intentions, F (3,376) = 5.19, p = .002 (Appendix F). This statistical significance remained significant when controlling for American identification, F (3,375)= 5.44, p = .001, and Canadian identification, F (3,375)= 5.14, p = .002. Nudges were more effective in changing general intentions than no nudge. In line with hypothesis 1, participants in the nudge only condition indicated a greater desire to change their energy consumption than those in the no nudge condition (Figure 2). Pairwise comparisons showed that there was a significant difference between the no nudge and the three nudge conditions: the nudge only condition, p = .002, the nudge with an absence of shared identity, p = .007, and the nudge with shared identity, p < .001. However, there were no significant differences between the three nudge conditions. These results partial support hypothesis 2, as participants in the nudge with shared identity condition indicated a greater desire to change their energy consumption than those in the no nudge condition. However, there was no significant difference between a nudge with shared identity and nudge only condition when changing intentions. Furthermore, the nudge with an absence of shared identity did not cause a reactance, but rather a desire to reduce their energy consumption.

Behaviour specific intentions. There was no effect of condition on behaviour specific intentions, F (3,376) = 1.01, p = .386. This effect remained non-significant when controlling for American identification, F (3,375) = 1.02, p = .382; Canadian identification, F (3,375) = 1.01, p = .387; and number of people in the household F (3,374) = .91, p = .436.

Motivation to engage. Analysis of the time that participants spent looking at/reading the brochure did not differ across conditions, F (3,376) = 1.33, p = .263. This effect remained non-significant when controlling for the time spent reading the initial electricity bill, F (3,375) = 1.19, p = .315.

Recalling strategies. There was no effect of condition and the number of energy saving strategies participants recalled, F (3,376) = 2.55, p = 0.56.

Identification. There was no effect of condition on American identification, F (3,376) = .61, p = .610; and no effect of condition on Canadian Identification, F (3,376) = .24, p = .868.

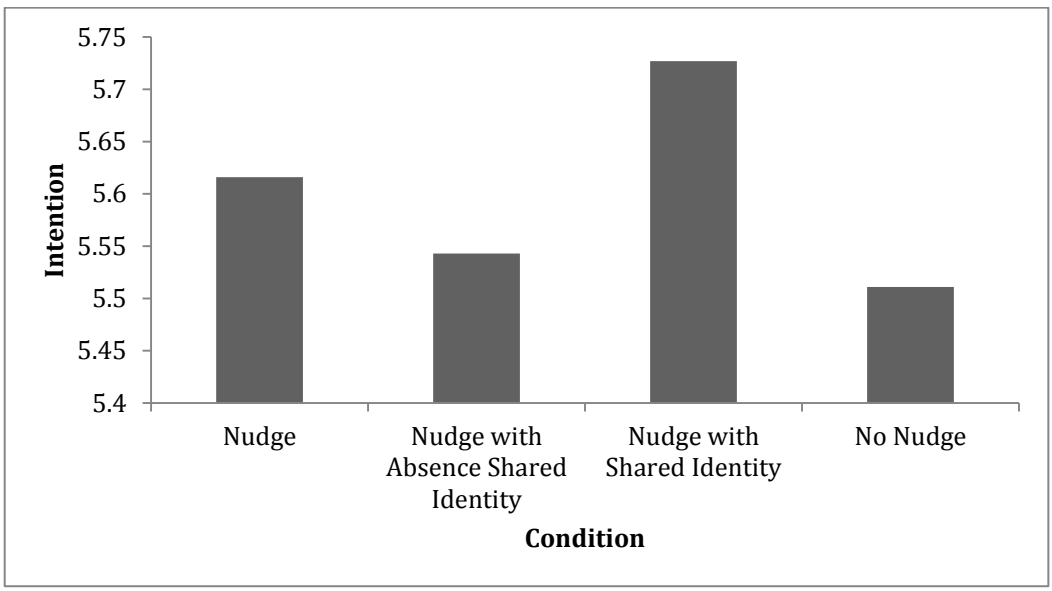


Figure 2. Study 1: The effect of condition on intentions to engage in reducing energy consumption

Table 1.

Study 1: Descriptive Statistics Between Condition and Dependent Variables

	Nudge Only		Nudge with Absence Shared Identity		Nudge with Shared Identity		No Nudge		
Dependent Measures	Mean	SD	Mean	SD	Mean	SD	Mean	SD	*p*
General intentions	5.61	1.11	5.54	1.24	5.73	.95	5.08	1.29	.002*
Behaviour specific intentions	5.59	.96	5.58	1.13	5.53	.86	5.36	.99	.386
Motivation to engage (seconds)	59.44	104.91	57.38	84.75	63.80	65.85	41.19	35.94	.315
Recalling strategies	4.62	2.16	5.21	2.12	4.88	2.38	4.35	2.18	.056
American identification	5.54	1.21	5.70	1.14	5.49	1.24	5.60	1.06	.610
Canadian identification	3.01	1.62	3.09	1.50	2.91	1.57	3.05	1.30	.868

Note: *$p < .05$

Testing Support for Hypothesis 3

Regression analyses were conducted to examine support for hypothesis 3. In particular, taking account of identification, we examined whether nudges that make use of shared identity are particularly effective for those who highly identified with the United States.

A multiple linear regression analysis was performed, inputting the nudge only and nudge with shared identity conditions. The two nudge conditions, mean centre of American identification, and the interaction between identification and nudge conditions were entered into the analysis as the predictors. General intention, behaviour specific intentions, motivation to engage, and recall were entered as the criterion. The nudge only condition was coded as 0 and the nudge with shared identity condition was coded as 1.

For intentions (Appendix G), the analysis revealed a significant main effect for identification, b = .266, t (191) = 3.13, p = .002, and an interaction between group identification and condition, b = -.248, t (191) = -2.08, p = .038 (Figure 3). The higher participants identified with the United States, the more intention they had in reducing their energy consumption.

Simple effects analysis showed that intentions to reduce their energy consumption were higher for participants in the nudge only condition who strongly identified with the United States, F (1,96) = 8.80, p = .004. Identification did not significantly affect intentions for participants in the nudge that relied on shared identity, F (1,95) = .05, p = .815. In other words, for participants higher in identification, the type of nudge was of little consequence to them. However, when identification was lower, it was only when a nudge with shared identity that intention to change energy behaviour was higher.

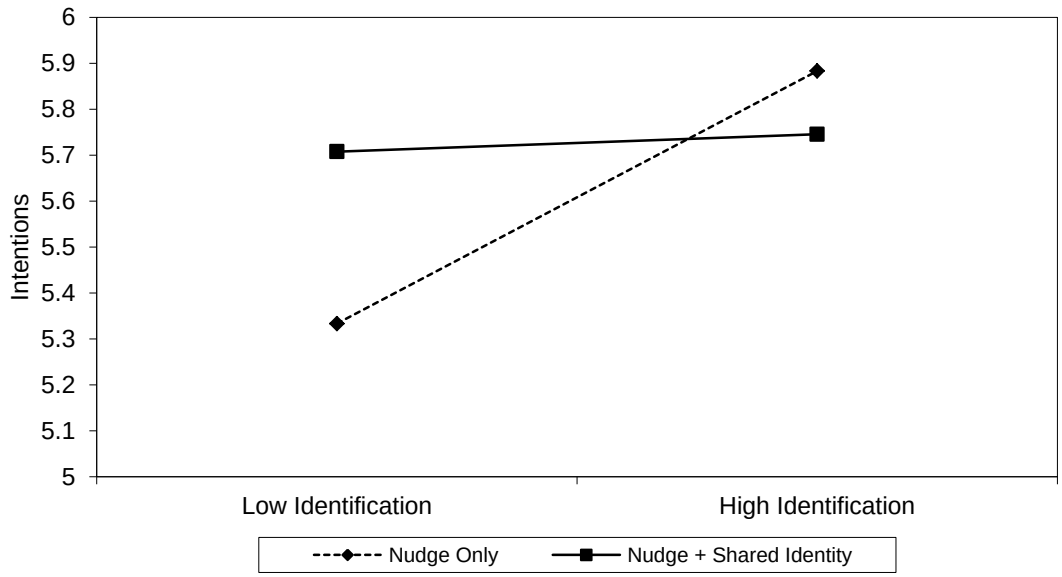


Figure 3. Study 1: The interaction between identification and condition (nudge only versus nudge and shared identity) on intentions to engage in environmentally sustainable behaviour

There were no significant main effects and interactions for behaviour specific intentions, F (3,191) = 2.06, p = .107, motivation to engage, F (3,191) = .19, p = .903, and recalling strategies, F (3,191) = 1.99, p = .117.

Discussion

The aim of this study was to examine if a nudge could change the intentions to engage in reducing energy consumption in the household. Furthermore, this study also examined whether a nudge paired with identity could impact the effectiveness of the nudge. The first hypothesis was supported in which a nudge was more effective in changing general intentions to reduce energy consumption compared to no nudge. This result reflected Momsen and Stoerk (2014) study, in which a nudge was more effective in creating intentional change than no nudge. However, this significant result was not found for

behaviour specific intentions, motivation to engage with strategies, and recalling strategies. The second hypothesis was partially supported. A nudge with shared identity showed the greatest difference from the no nudge condition in changing general intentions. This result reflected similar findings by Lewis and Neighbors (2007). However, there was no significant difference between the nudge only and nudge with shared identity. Furthermore, the nudge with an absence of shared identity did not cause a significant reactance compared to no nudge. This may be due to the out-group (Canadians) not differing greatly to the participants. The third hypothesis was not supported, as the type of nudge did not significantly affect participants who highly identified with the United States. Highly identifying participants in the nudge only condition could have assumed the average and efficient users were in-group members and salience may not have been needed (Lewis & Neighbors, 2007). However, participants with low identification had more intention to change their energy consumption behaviour when exposed to a nudge with shared identity.

Study 2

The aim of the second study was to replicate the findings of study one. In addition, we were interested in creating a stronger test of the reactance hypotheses: the notion that nudges that make use of out-group referents would create reactance and resistance. We examined whether presenting participants with a stronger out-group would create more reactance against the nudge. In study two, we presented participants in the nudge with an absence of shared identity condition with information about the energy consumption of Russians — a stronger out-group due to Russia's political history with the United States (Thompson & Dreyer, 2011).

Another difference from study one was that we asked participants in the nudge with shared identity condition to “write three things they liked about being an American.” This was meant to enhance the salience of in-group identity, providing a stronger manipulation of the nudging through shared in-group identity condition. Priming participants should make the American social group identity more accessible (Oakes et al., 1994).

Method

Participants

Participants were 303 Mechanical Turk (MTurk) workers. Participants with incomplete data (less than 50% completed) were deleted. Participants in the nudge conditions were given manipulation checks to test if they comprehended the manipulations correctly. (*Did you use more, the same, or less than the average user; did you use more, the same, or less than the efficient user).* We deleted 41 participants that incorrectly indicated that the bill stated they used less or the same than the comparison energy users. The final data set included 260 participants. The sample’s age ranged from 18 to 71 (*M* = 37.28, *SD* = 12.89), with 129 male participants (49%). There were 66 participants in the nudge only condition, 58 in the nudge with an absence of shared identity condition, 60 in the nudge with shard identity condition, and 76 in the no nudge condition.

Design

The design of study two was nearly identical to study one, except for some changes for the nudge with an absence of shared identity and nudge with shared identity conditions. Instead of Canadians users, participants in the nudge with an absence of shared identity condition were informed that their bill

would compare their energy use to households in Russia. The comparable users was changed to the *average Russian* and *efficient Russian user*. To increase the salience of shared identity, participants in the nudge with shared identity condition were asked to “write three things they liked about being an American” before reviewing their electricity bill. The hypothetical energy use listed for the participant (1902 kWh), average user (1626 kWh), and efficient user (635 kWh) was the same as study one.

Dependent Measures

Participants were asked to complete the same measures that were presented in study one: three general intention items on reducing energy consumption (α = .81), 10 behaviour specific intention questions on changing specific pro-environmental behaviours (α = .88), and six identification questions: four for American identification (α = .91) and two for Russian identification (α = .93). These questions were again recorded on a 7-point Likert scale with responses ranging from strongly disagree (1) to strongly agree (7).

Participants in study two also reviewed the same energy savings brochure in study one (Appendix C). The time spent reading this brochure was measured in seconds and was assumed to be an indication of motivation to engage in more environmentally sustainable behaviour. Participants were also asked to recall as many energy saving strategies listed in the brochure that they could remember. Strategies that were listed correctly were counted and were coded 0 – 13 by the researcher, with 0 (zero) being no correct answers and 13 being all correct answers. The more correct strategies that were recalled, the more motivation participants had in remembering energy saving strategies (Roebers et al., 2001).

Three additional questions measuring environment saving activities were included in study two (*I would participant in renewable energy savings programs, I would donate time/money towards environmental organisations).* Cronbach's alpha was .71*.* Agreement with these statements was again recorded on a 7-point Likert scale ranging from strongly disagree (1) to strongly agree (7). The third question asked *how much of a monetary donation would you contribute towards environmental organisations?"* Participants wrote their answer as a numeric value. It was predicted that participants who were exposed to a nudge would participate in more environment saving activities than those exposed to no nudge (Costa & Kahn, 2013). Furthermore, participants exposed to in-group identity nudges would have a greater motivation to participate in these activities. In contrast, participants exposed to out-group identity nudge would have a greater resistance. Participants completed the same demographic information as study one. After the questionnaire, participants were directed to a debrief page and were given a validation code for payment.

Results

Testing Support for Hypotheses 1 and 2

To examine support for hypotheses 1 and 2, a series of one-way analysis of variance (ANOVA) were performed to examine the effects of the four conditions on general intentions, behaviour specific intentions, motivation to engage with strategies, recalling strategies, and environment saving activities. To reduce error variance, the same analyses were performed controlling for American and Russian identification. Means, standard deviations and p values are presented in Table 2.

General intentions. There was a statistical effect of condition on general intentions, F (3, 256) = 2.79, p = .041 (Appendix H). This statistical significance remained significant when controlling for American identification, F (3,253) = 2.82, p = .040 and Russian identification, F (3,253) = 2.66, p = .049. Pairwise comparisons showed that there was a significant difference between nudge with shared identity and nudge with an absence of shared identity, p = .031; and nudge with shared identity and no nudge, p = .033. However, there was no significant difference between a nudge and no nudge. These results does not support hypothesis 1 but partially support hypothesis 2, as there was a significant difference between a nudge with shared identity and no nudge (Figure 4). However, the nudge with an absence of shared identity did not cause a significant reactance compared to the no nudge and nudge only conditions.

Behaviour specific intentions. There was no effect of condition and behaviour specific intentions, F (3,256) = .59, p = .623. This effect remained non-significant when controlling for American identification, F (3,253) = .66, p = .579; Russian identification, F (3,253) = .55, p = .647; and number of people in the household, F (3,253) = .61, p = .611.

Motivation to engage. Analysis of the time that participants spent looking at/reading the brochure did not differ across conditions, F (3,256) = .423, p = .736. This effect remained non-significant when controlling for the time spent reading the initial electricity bill F (3,255) = .58, p = .627.

Recalling strategies. There was no effect of condition and the number of energy saving strategies participants recalled, F (3, 256) = .84, p = .473.

Environment saving activities. There was no effect of condition and environment saving activities, F (3,256) = .89, p = .446. There was also no effect of condition and monetary contributions, F (2,251) = .96, p = .414.

Identification. There was no effect of condition and American identification, F (3,254) = .19, p = .901; and no effect of condition and Russian Identification, F (3,254) = 1.44, p = .231.

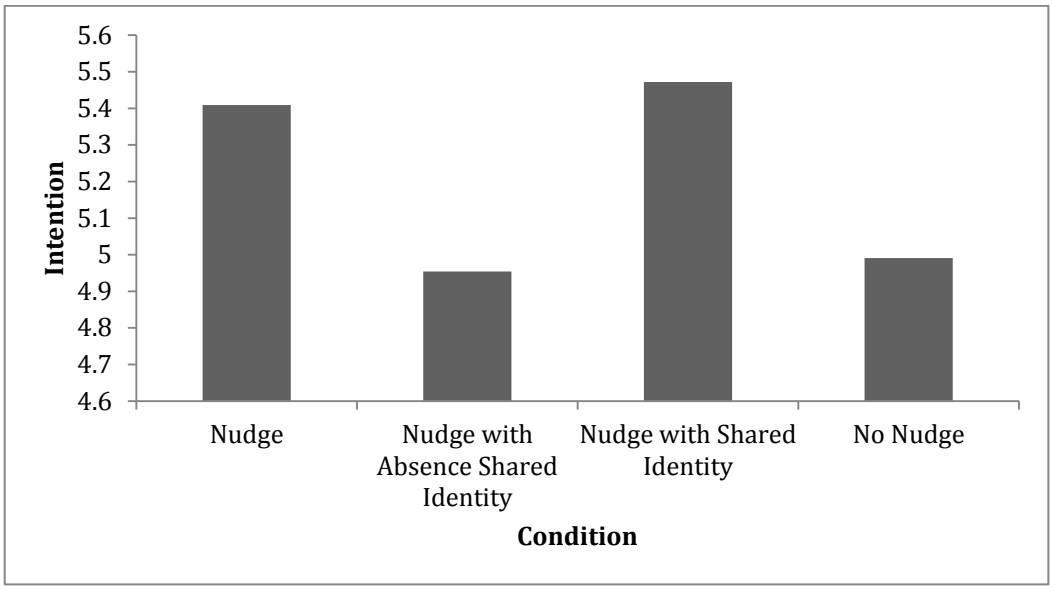


Figure 4. Study 2: The effect of condition on intentions to engage in reducing energy consumption

Table 2.

Study 2: Descriptive Statistics Between Condition and Dependent Variables

	Nudge Only		Nudge with Absence Shared Identity		Nudge with Shared Identity		No Nudge		
Dependent Measures	Mean	SD	Mean	SD	Mean	SD	Mean	SD	*p*
General intentions	5.41	1.31	4.95	1.57	5.47	1.21	4.99	1.12	.041*
Behaviour specific intentions	5.47	1.11	5.25	1.26	5.49	1.09	5.35	1.11	.623
Motivation to engage (seconds)	44.35	36.16	44.14	62.29	36.01	32.80	42.15	48.13	.627
Recalling strategies	5.17	2.30	4.79	1.92	4.57	1.93	4.89	2.15	.473
American identification	5.40	1.25	5.57	1.41	5.51	1.23	5.50	1.27	.901
Russian identification	2.07	1.31	2.08	1.14	1.91	1.06	2.35	1.48	.231
Environment saving activities	18.88	1.11	18.57	1.33	18.90	1.41	18.69	1.37	.446
Monetary contribution	43.52	92.78	41.93	89.65	59.49	109.91	33.39	64.30	.414

*Note: *p<.05*

Testing Support for Hypothesis 3

Regression analyses were conducted to examine support for hypothesis 3. In particular, taking account of identification, we examined whether nudges that make use of shared identity are particularly effective for those who highly identified with the United States.

A multiple linear regression analysis was performed, inputting the nudge only and nudge with shared identity conditions. The two nudge conditions, mean centre American identification, and the interaction between identification and nudge conditions were entered into the analysis as the predictors. General intention, behaviour specific intentions, motivation to engage with strategies, recalling strategies, and environment saving activities were entered as the criterion. The nudge only condition was coded as 0 and the nudge with shared identity condition was coded as 1.

For intentions (Appendix I), the analysis revealed an interaction between group identification and conditions, b = -.330, t (121) = 1.80, p =. 074 (Figure 5).

Simple effects analysis showed that intentions to reduce their energy consumption was higher for participants in the nudge with shared identity condition who strongly identified more with the US, F (1,58) = 5.25, p = .026. Identification did not significantly affect intentions for participants in the nudge only condition, F (1,63) = .12, p = .730. In this study, participants who had higher identification had more intention to change their energy behaviour when exposed to a nudge with shared identity. When participants have low identification, there was less intention to change when exposed to a nudge with shared identity rather than a nudge only.

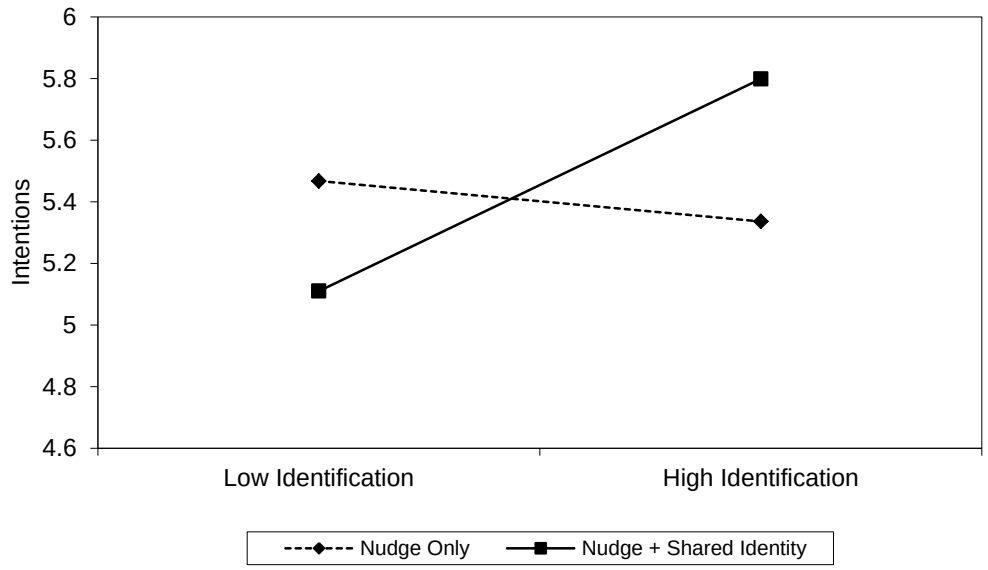


Figure 5. Study 2: The interaction between identification and condition (nudge only versus nudge and shared identity) on intentions to engage in environmentally sustainable behaviour

For environment saving strategies, there was only a main effect of American identification b = .26, t (121) = 2.20, p = .030. The higher the identification participants had with the United States, the more likely they will participate in environment saving activities.

There was no significant main effects and interactions for behaviour specific intentions, F (3,121) = 1.00, p = .392, motivation to engage, F (3,121) = 2.41, p = .070, and recalling strategies, F (3,121) = 2.15, p = .097.

Discussion

The aim of study two was to replicate and improve the results from study one. In addition, we were interested in examining if a stronger out-group (Russians) would create a greater reactance and resistance against a nudge when made salient. The first hypothesis was not supported, as a nudge only condition was not significantly different from the no nudge condition in changing

general intentions and behaviour specific intentions, enhancing motivation to engage with and recall energy saving strategies, and participating in environment saving activities. The second hypothesis was supported, in which the nudge with shared identity was able to significantly change general intentions to reduce energy consumption when compared to no nudge, but not compared to nudge only. However, this was not found for the other dependent measures. When shared identity was made salient, participants had more intention to change their energy consumption to align with other in-group members (Lewis & Neighbors, 2007). A nudge with an absence of shared identity showed the predicted reactance effect but was only significantly different from the nudge with shared identity condition for the general intentions measure. The third hypothesis was supported, as participants with high identification had more intentions to change their energy consumption behaviour when exposed to a nudge with shared identity. Participants with low identification had more intention to change their energy consumption behaviour when exposed to a nudge only rather than a nudge with shared identity. Making identity salient may have caused some resistance for low identifying participants. This finding differs to study one, in which low identifying participants had more intention to change when exposed to a nudge with shared identity. However, it is important to note that this interaction was marginally non-significant.

General Discussion

The aim of this study was to investigate if a nudge could change intentions to engage with reducing energy consumption in households. Nudges have been suggested as a persuasive and cost effective tool that could change

behaviour without restricting freedom of choice (John, 2011; Thaler & Sunstein, 2009). However, previous literature has suggested it can have modest effects in creating change (Mols et al., 2015). This study focused on utilising an anchor nudge with social influence, a piece of information that guides individuals to adjust their behaviour in an appropriate direction (Schultz et al., 2007; Thaler & Sunstein, 2009; Wansink et al., 1998). To expand on the previous nudge literature, this study examined if an anchor nudge with shared identity (in-group membership) would be more effective in reducing energy consumption. In contrast, this study also examined if a nudge with an absence of shared identity (out-group membership) would cause a reactance effect. The three hypotheses for this study predicted that: 1. A nudge would be more effective in changing general intentions and behaviour specific intentions, and enhance motivation to engage with and recall energy saving strategies; 2. Identity based nudges would impact the effectiveness of a nudge, in which a nudge with shared identity would be more effective in changing intentions and motivations. In contrast, a nudge with an absence of shared identity would create reactance and resistance in changing intentions and motivation; 3. A nudge with shared identity would be most effective against those who have high identification with the salient shared identity.

Findings

Only study one supported hypothesis one, in which participants in the nudge only condition significantly changed their intentions to reduce their energy consumption when compared to no nudge. However, this was not found for the other dependent measures. This result aligns with previous research by Momsen and Stoerk (2014) who found that a nudge was more effective than no

nudge in changing intentions to participate in renewable energy. Furthermore, this result supports previous research by Schultz et al. (2007) and Costa and Kahn (2013), in which a nudge was more effective in changing energy use behaviour compared to their baseline measures. Study two found the same direction as study one for intentions, but was marginally non-significant. The smaller sample size in study two could have reduced the power, which could have contributed to the non-significant result (Morgan & Carmen, 2007). The results from study two suggested that nudges have a small and subtle effect that is influenced by sample size (Mols et al., 2015). Future research could utilise a larger sample size to find similar significant results that were found in study one. Again, no significant effects were found for the other dependent measures in study two.

Hypothesis two was partially supported in both studies, as individuals who were exposed to a nudge with shared identity had more intention to reduce their energy consumption than those who did not receive a nudge. Participants in this condition had a greater desire to align their behaviour with in-group members. However, this result was not found for behaviour specific intentions, motivation to engage with strategies, recalling strategies, and environment saving activities. This results builds on the findings by Costa and Kahn (2013), in which identity influenced the effectiveness of the nudge. Unlike Costa and Kahn's study, this study was able to manipulate identity through nationalism (America identification versus Canadian/Russian identification). Furthermore, these findings were similar to the Lewis and Neighbors (2007) study, who found salient identity was more effective in creating behaviour change.

In regards to a nudge with an absence of shared identity, it was not significantly different from the nudge only and no nudge conditions on all dependent measures for both studies. However, for general intentions, a nudge paired with a stronger Russian out-group identity showed a stronger reactance than the nudge with the Canadian out-group identity. Despite finding a non-significant result in study two, this reactance effect is similar to previous reactance literature (Grandpre et al., 2003; McGarty et al., 1994; Oyserman et al., 2007). A larger sample size may find a significant difference between the nudge with absence of shared identity and nudge only condition.

A possible explanation for the non-significant results for the other dependent measures could be that they did not strongly associate with the nudge, which focused on reducing household energy consumption. Instead, the items and stimulus were more focused on specific environmentally sustainable behaviours such as using public transport and having shorter showers. This finding suggested that a nudge may only be effective in creating intention and behavioural change for the target behaviour (energy consumption) and may not have a spillover effect on similar behaviours (environmentally sustainable behaviour) (Truelove, Carrico, Weber, Raimi, & Vandenbergh, 2014).

Hypothesis three was partially supported in study two, with highly identifying participants more likely to change their general intentions to reduce their energy consumption when exposed to a nudge with shared identity (Lewis & Neighbors, 2007). This result may have occurred as participants in study two were primed for their American identification, making their identity more salient. The more accessible social group could have influenced highly identifying participants to align their behaviour with their in-group members (Lewis &

Neighbors, 2007; Stets & Burke, 2000). These results suggested that a nudge with shared identity would be more effective if participants had high identification with the salient reference group. Furthermore, a nudge with shared identity could be less effective than a nudge on its own when presented to participants who have low identification with the salient reference group. However it is important to note the interaction was marginally non-significant. This non-significant result could have occurred due to the smaller sample size, reinforcing previous findings that nudges make modest effects (Marteau, 2011; Mols et al., 2015). Future research could implement a larger sample size to test if this interaction is statistically significant. Hypothesis 3 was not supported in study one but there was a significant interaction between American identification and the two nudge conditions on the general intentions criterion. There was no difference in intentions between nudge only and nudge with shared identity for participants with higher identification. This may be due to participants in the nudge only condition assuming the other users were in-group members without needing to make identity salient (Lewis & Neighbors, 2007). Participants with lower identification had more intention to change their energy consumption when presented with a nudge with shared identity. Making shared identity salient could have influenced low identifying participants in aligning their behaviour with the reference group, as they still had above average American identification. Results from the two studies have demonstrated that a nudge can produce small to moderate effects, but can be influenced by sample size when finding significance.

Theoretical and Practical Implications

This study has found similar results to previous research by Costa and Kahn (2013), Lewis and Neighbors (2007), Momsen and Stoerk (2014), and Schultz et al. (2007) who have found nudges to be effective in creating intentional and behavioural change. Unlike some previous studies, this particular study was able to manipulate nudges with social influence in an experimental setting, which allowed a controlled observation of a nudge's underlying mechanisms. This study was able to support previous findings in field research that can be influenced by external variables. However, this study found that a nudge's effects are small and can be prone to sample size, despite being in a controlled setting with limited noise.

This study has also investigated how social identity could influence the effectiveness of a nudge, particularly when an in-group or out-group is made salient. Some of the results found in this study supported previous literature, in which individuals are more likely to perform a particular behaviour when in-group membership is made salient (Greenaway et al., 2015; Jain et al., 2013). This study also demonstrated that when a nudge with shared identity is made salient, it could be more effective to those who highly identify with the shared identity. Furthermore, this study also found that a nudge with shared identity could be more effective towards participants who have low identification. This study was able to demonstrate similar findings to Lewis and Neighbors (2007), indicating that shared identity could be paired with different nudges in creating intention and behavioural change. However, it could be suggested that social identity salience may not be needed for highly identifying participants, as they assume the comparable group is their in-group.

Unlike previous studies, this study investigated the effects of a nudge with an absence of share identity on energy consumption. As an experimental study, the absence of shared identity could be manipulated and controlled without having harming consequences towards participants (using more energy could result in causing financial harm towards households). By providing hypothetical reports and intention measures, this study gave an ethical insight on how an out-group salience could affect a nudge's effectiveness.

The nudges in this study have also demonstrated its small power, as it was not able to change intentions to engage with other environmental behaviours. This partially supports previous criticisms, as a nudge can only create change for the target behaviour and its power cannot change similar behaviours simultaneously (John, 2011; Truelove et al., 2014). In regards to environmental research, a separate nudge must be implemented for every particular aspect of environmental conservation (public transport use, recycling, energy consumption) to create behavioural change.

This study has added to the nudge theory literature, as it demonstrated social identity could impact a nudge's effectiveness in changing behaviour in the desired direction. Though a nudge on its own can create intentional and behavioural change, its effectiveness can be influenced by identity salience. Furthermore, this study suggested that nudges that make use of shared identity could increase its impact when creating behavioural change without being affected by sample size.

This study could develop future research in testing different aspects of nudges such as status quo bias (Rozin et al., 2011), default option (Johnson & Goldstein, 2003), reminder messages (Altmann & Traxler, 2014), or framing

(Momsen & Stoerk, 2014; A. Tversky & Kahneman, 1981) in experimental settings and pairing them with shared identity.

There are a number of practical implications that arise from this study. As nudges are commonly used in creating behavioural change, this study could lead to magnifying the effects of nudges by making use of shared identity in domains such as charitable giving, superannuation, or tax compliance. Furthermore, a nudge that utilises social identity could be modified in targeting specific groups and identities that a nudge on its own cannot influence. More specifically, electricity bills could make shared identity more salient for participants who are using more energy than the average household.

Limitations and Future Research

This study was able to demonstrate the effectiveness and underlying mechanisms of nudges and nudges with social identity in experimental conditions. However, there were some limitations to this study that can be further addressed in future research. One limitation is that behaviour was not a direct measure in this study. Though it was in the initial plan of the study to measure behaviour at two time points, this was unable to be followed through due to time and resource constraints. Instead, general and specific intentions were the dependent measures in this study to substitute behavioural measures. Though the theory of planned behaviour has found intentions can be a strong predictor of behaviour (Ajzen, 1985), previous literature (Montano & Taplin, 1991; Sheeran, 2002) has found that there is evidence that intentions do not always successfully lead to behaviour. It cannot be assumed that participants who intend on changing their behaviour will actually follow through in doing it. Furthermore, participants completed self-report measures, which are not

always accurate in capturing true variance (Haeffel & Howard, 2010). To overcome this limitation, intentions and behaviours could be measured to examine if nudges can successfully change behaviour. Theory of planned behaviour could also be examined to determine the relationship between intentions and behaviours. Participants' intentions to reduce energy and their electricity use or carbon footprint could be measured concurrently.

Another possible limitation to this study was the sole use of MTurk participants. Though previous research has found sourcing from an MTurk participant pool was a reliable method in recruiting participants (Buhrmester, Kwang, & Gosling, 2011; Rand, 2012), there are researchers and reviewers who feel MTurk participants do not pay enough attention to study materials (Goodman, Cryder, & Cheema, 2013). Participants recruited in this study were an American exclusive cluster sample to ensure shared identity and absence of shared identity could be manipulated and controlled for. Due to this sampling, these results may not be representative of the population. To address this limitation, a mixture of MTurk participants and community participants could be used in future research.

As previously mentioned, future research could investigate whether nudges with shared identity can change behaviour compared to a nudge on its own. Nudges with an absence of shared identity could also be used to test its effects on creating behavioural change through reactance. Furthermore, it would be interesting to examine the long-term effects of nudges with shared identity and if continued salience could be consistently effective in maintaining behaviour or if participants would habituate to the nudge with shared identity.

Future research could also examine and compare if other persuasive tools, such as social identity approach, could be more effective than nudges with shared identity in changing behaviour in the short and long term.

Conclusion

The present study examined how a nudge can reduce energy consumption in households. The findings from this study found evidence that a nudge can change intentions to reduce energy consumption when compared to a no nudge condition. Nudges with shared identity were found to cause the greatest change of intentions when compared to a no nudge condition. Furthermore, when individuals highly identified with the salient shared identity, they were more likely to change their intentions in order to reduce energy consumption. The findings from this study have contributed towards the nudge theory literature by demonstrating a nudge's effectiveness within an experimental setting. These results have mirrored previous research that have utilised a nudge in reducing energy consumption behaviour through field experiments. Furthermore, this study uniquely demonstrated how social identity, particularly in-group and out-group processes, can impact the effectiveness of a nudge. When nudges are paired with shared identity, they showed the greatest impact in changing intentions. However, this study found that even in an experimental setting, nudges still have a modest impact in creating intentional change.

This study has outlined future research that could address limitations and future research questions. This includes measuring intentions and behaviours when participants are exposed to a nudge and a nudge with social identity (in-group or out-group). Future research could also examine the long-

term effects a nudge with shared identity could have on changing behaviour and if it would be as effective as other persuasive tools such as social identity approach.

Nudges have demonstrated the ability to change an individual's intentions and behaviours towards a more beneficial goal. However, these subtle behavioural tools do not always demonstrate consistent and significant effects. Acknowledging and utilising shared identity could enhance and maintain a nudge's ability to change behaviour for the better. Furthermore, creating effective nudges can assist in contributing towards a more sustainable environment.

References

Ajzen, I. (1985). From Intentions to Actions: A Theory of Planned Behavior. In J. Kuhl & J. Beckmann (Eds.), *Action Control* (pp. 11-39): Springer Berlin Heidelberg.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179-211. doi:10.1016/0749-5978(91)90020-T

Allcott, H. (2011). Social norms and energy conservation. *Journal of Public Economics, 95*(9–10), 1082-1095. doi:http://dx.doi.org/10.1016/j.jpubeco.2011.03.003

Altmann, S., & Traxler, C. (2014). Nudges at the dentist. *European Economic Review, 72*, 19-38. doi:10.1016/j.euroecorev.2014.07.007

Asch, S. E. (1952). *Social psychology*. New York: Prentice-Hall.

Asch, S. E. (1955). Opinions and Social Pressure (Vol. 193, pp. 31-35).

Ayres, I., Raseman, S., & Shih, A. (2013). Evidence from Two Large Field Experiments that Peer Comparison Feedback Can Reduce Residential Energy Usage. *Journal of Law, Economics, and Organization, 29*(5), 992-1022. doi:10.1093/jleo/ews020

Borsari, B., & Carey, K. B. (2001). Peer influences on college drinking: a review of the research. *Journal of substance abuse, 13*(4), 391-424. doi:10.1016/S0899-3289(01)00098-0

Brehm, J. W. (1966). *A theory of psychological reactance*. New York: Academic Press.

Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A New Source of Inexpensive, Yet High-Quality, Data?

Perspectives on Psychological Science, 6(1), 3-5. doi:10.1177/1745691610393980

Cialdini, R. B., & Goldstein, N. J. (2004). Social influence: Compliance and conformity. *Annual Review of Psychology, 55*(1), 591-621. doi:10.1146/annurev.psych.55.090902.142015

Clark, R. L., Maki, J. A., & Morrill, M. S. (2014). Can simple informational nudges increase employee participation in a 401(k) plan? *Southern economic journal, 80*(3), 677-701. doi:10.4284/0038-4038-2012.199

Costa, D. L., & Kahn, M. E. (2013). Energy conservation "nudges" and environmentalist ideology: Evidence from a randomized residential electricity field experiment. *Journal of the European Economic Association, 11*(3), 680-702. doi:10.1111/jeea.12011

Dayan, E., & Bar-Hillel, M. (2011). Nudge to nobesity II: Menu positions influence food orders. *Judgment and Decision Making, 6*(4), 333-342. Retrieved from http://www.scopus.com/inward/record.url?eid=2-s2.0-79960073311&partnerID=40&md5=767a67b035099b3a21a566057fc77ee2

Deutsch, M., & Gerard, H. B. (1955). A study of normative and informational social influences upon individual judgment. *The Journal of Abnormal and Social Psychology, 51*(3), 629-636. doi:10.1037/h0046408

Dillard, J. P., & Shen, L. (2005). On the Nature of Reactance and its Role in Persuasive Health Communication. *Communication Monographs, 72*(2), 144-168. doi:10.1080/03637750500111815

Festinger, L. (1954). A Theory of Social Comparison Processes. *Human Relations, 7*(2), 117-140. doi:10.1177/001872675400700202

Goldstein, N. J., Cialdini, R. B., & Griskevicius, V. (2008). A Room with a Viewpoint: Using Social Norms to Motivate Environmental Conservation in Hotels. *35*(3), 472-482. doi:10.1086/586910

Goode, C., Balzarini, R. H., & Smith, H. J. (2014). Positive peer pressure: Priming member prototypicality can decrease undergraduate drinking. *Journal of Applied Social Psychology, 44*(8), 567-578. doi:10.1111/jasp.12248

Goodman, J. K., Cryder, C. E., & Cheema, A. (2013). Data Collection in a Flat World: The Strengths and Weaknesses of Mechanical Turk Samples. *Journal of Behavioral Decision Making, 26*(3), 213-224. doi:10.1002/bdm.1753

Government of South Australia. (2015). Saving energy at home. Retrieved from https://www.sa.gov.au/__data/assets/pdf_file/0003/75918/ED10-Easy-ways-to-save-DL_Feb-2014_web.pdf

Grandpre, J., Alvaro, E. M., Miller, C. H., Burgoon, M., & Hall, J. R. (2003). Adolescent Reactance and Anti-Smoking Campaigns: A Theoretical Approach. *Health Communication, 15*(3), 349-366. doi:10.1207/S15327027HC1503_6

Greenaway, K. H., Wright, R. G., Willingham, J., Reynolds, K. J., & Haslam, S. A. (2015). Shared Identity Is Key to Effective Communication. *Personality and Social Psychology Bulletin, 41*(2), 171-182. doi:10.1177/0146167214559709

Griskevicius, V., Cialdini, R. B., & Goldstein, N. J. (2008). Social norms: An underestimated and underemployed lever for managing climate change. *International Journal of Sustainability Communication, 3*(1), 5-13.

Haeffel, G. J., & Howard, G. S. (2010). Self-Report: Psychology's Four-Letter Word. *The American Journal of Psychology, 123*(2), 181-188. doi:10.5406/amerjpsyc.123.2.0181

Hogg, M. A., & Abrams, D. (1988). *Social identifications: a social psychology of intergroup relations and group processes*. London ; New York: Routledge.

Jain, R. K., Gulbinas, R., Taylor, J. E., & Culligan, P. J. (2013). Can social influence drive energy savings? Detecting the impact of social influence on the energy consumption behavior of networked users exposed to normative eco-feedback. *Energy and Buildings, 66*, 119-127. doi:10.1016/j.enbuild.2013.06.029

John, P. (2011). *Nudge, nudge, think, think: experimenting with ways to change civic behaviour* (Vol. 1). London: Bloomsbury Academic.

Johnson, E. J., & Goldstein, D. (2003). Medicine - Do defaults save lives? *Science, 302*(5649), 1338-1339. doi:10.1126/science.1091721

Kahn, M. E. (2007). Do greens drive Hummers or hybrids? Environmental ideology as a determinant of consumer choice. *Journal of Environmental Economics and Management, 54*(2), 129-145. doi:10.1016/j.jeem.2007.05.001

Kotchen, M. J., & Moore, M. R. (2008). Conservation: From Voluntary Restraint to a Voluntary Price Premium. *Environmental and Resource Economics, 40*(2), 195-215. doi:10.1007/s10640-007-9148-x

Lewis, M. A., & Neighbors, C. (2007). Optimizing personalized normative feedback: The use of gender-specific referents. *Journal of Studies on Alcohol and Drugs, 68*(2), 228-237. doi:10.15288/jsad.2007.68.228

Mackie, D. M., Worth, L. T., & Asuncion, A. G. (1990). Processing of Persuasive In-Group Messages. *Journal of Personality and Social Psychology, 58*(5), 812-822. doi:10.1037/0022-3514.58.5.812

Marteau, T. (2011). Judging nudging: can nudging improve population health? *BMJ: British Medical Journal, 342*(7791), 263-265. doi:10.1136/bmj.d228

McGarty, C., Haslam, S. A., Hutchinson, K. J., & Turner, J. C. (1994). The Effects of Salient Group Memberships on Persuasion. *Small Group Research, 25*(2), 267-293. doi:10.1177/1046496494252007

Milfont, T. L., & Duckitt, J. (2010). The environmental attitudes inventory: A valid and reliable measure to assess the structure of environmental attitudes. *Journal of Environmental Psychology, 30*(1), 80-94. doi:http://dx.doi.org/10.1016/j.jenvp.2009.09.001

Mols, F., Haslam, S. A., Jetten, J., & Steffens, N. K. (2015). Why a nudge is not enough: A social identity critique of governance by stealth. *European Journal of Political Research, 54*(1), 81-98. doi:10.1111/1475-6765.12073

Momsen, K., & Stoerk, T. (2014). From intention to action: Can nudges help consumers to choose renewable energy? *Energy Policy, 74*(0), 376-382. doi:http://dx.doi.org/10.1016/j.enpol.2014.07.008

Montague, M., Borland, R., & Sinclair, C. (2001). Slip! Slop! Slap! and SunSmart, 1980-2000: Skin Cancer Control and 20 Years of Population-Based Campaigning. *Health Education & Behavior, 28*(3), 290-305. doi:10.1177/109019810102800304

Montano, D. E., & Taplin, S. H. (1991). A test of an expanded theory of reasoned action to predict mammography participation. *Social Science &*

Medicine, 32(6), 733-741. doi:http://dx.doi.org/10.1016/0277-9536(91)90153-4

Morgan, B. L., & Carmen, R. W. V. V. (2007). Understanding Power and Rules of Thumb for Determining Sample Sizes. *Tutorials in Quantitative Methods for Psychology, 3*(2), 43-50. Retrieved from http://www.tqmp.org/RegularArticles/vol03-2/p043/p043.pdf

Nolan, J. M., Schultz, P. W., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2008). Normative Social Influence is Underdetected. *Personality and Social Psychology Bulletin, 34*(7), 913-923. doi:10.1177/0146167208316691

NSW Department of Premier and Cabinet. (2015). Behavioural Insight - Community of Practice. Retrieved from http://bi.dpc.nsw.gov.au/

Oakes, P. J., Haslam, S. A., & Turner, J. C. (1994). *Stereotyping and social reality*. Oxford, England ; Cambridge: Blackwell.

Oldmeadow, J. A., Platow, M. J., Foddy, M., & Anderson, D. (2003). Self-Categorization, Status, and Social Influence. *Social psychology quarterly, 66*(2), 138-152. doi:10.2307/1519844

Oyserman, D., Fryberg, S. A., & Yoder, N. (2007). Identity-Based Motivation and Health. *Journal of Personality and Social Psychology, 93*(6), 1011-1027. doi:10.1037/0022-3514.93.6.1011

Postmes, T., Haslam, S. A., & Jans, L. (2013). A single‐item measure of social identification: Reliability, validity, and utility. *British Journal of Social Psychology, 52*(4), 597-617. doi:10.1111/bjso.12006

Rains, S. A., & Turner, M. M. (2007). Psychological Reactance and Persuasive Health Communication: A Test and Extension of the Intertwined Model.

Human Communication Research, 33(2), 241-269. doi:10.1111/j.1468-2958.2007.00298.x

Rand, D. G. (2012). The promise of Mechanical Turk: How online labor markets can help theorists run behavioral experiments. *Journal of Theoretical Biology, 299*, 172-179. doi:10.1016/j.jtbi.2011.03.004

Reiss, P. C., & White, M. W. (2008). What changes energy consumption?: prices and public pressures. *The Rand journal of economics, 39*(3), 636-663. doi:10.1111/j.1756-2171.2008.00032.x

Richardson, L., John, P., & Cotterill, S. (2011). *Nudge, Nudge, Think, Think*: Bloomsbury Publishing.

Roebers, C. M., Moga, N., & Schneider, W. (2001). The Role of Accuracy Motivation on Children's and Adults' Event Recall. *Journal of Experimental Child Psychology, 78*(4), 313-329. doi:10.1006/jecp.2000.2577

Rozin, P., Scott, S., Dingley, M., Urbanek, J. K., Jiang, H., & Kaltenbach, M. (2011). Nudge to nobesity I: Minor changes in accessibility decrease food intake. *Judgment and Decision Making, 6*(4), 323-332. Retrieved from http://www.scopus.com/inward/record.url?eid=2-s2.0-79960040698&partnerID=40&md5=4044400d8018add3e8a59f5558f9c460

Schultz, P. W., Khazian, A. M., & Zaleski, A. C. (2008). Using normative social influence to promote conservation among hotel guests. *Social Influence, 3*(1), 4-23. doi:10.1080/15534510701755614

Schultz, P. W., Nolan, J. M., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2007). The constructive, destructive, and reconstructive power of social

norms. *Psychological Science, 18*(5), 429-434. doi:10.1111/j.1467-9280.2007.01917.x

Sheeran, P. (2002). Intention-Behavior Relations: A Conceptual and Empirical Review. *European Review of Social Psychology, 12*(1), 1-36. doi:10.1080/14792772143000003

Stets, J. E., & Burke, P. J. (2000). Identity Theory and Social Identity Theory. *Social psychology quarterly, 63*(3), 224-237. doi:10.2307/2695870

Strack, F., & Deutsch, R. (2004). Reflective and Impulsive Determinants of Social Behavior. *Personality and Social Psychology Review, 8*(3), 220-247. doi:10.1207/s15327957pspr0803_1

Tajfel, H., & Turner, J. (1979). An integrative theory of intergroup conflict. In W. G. Austin & S. Worchel (Eds.), *The social psychology of intergroup relations* (pp. 33-47). Monterey, CA: Brooks/Cole Pub. Co.

Terry, D. J., Hogg, M. A., & White, K. M. (1999). The theory of planned behaviour : Self- Identity, social identity and group norms. *British Journal of Social Psychology, 38*(3), 225-244. doi:10.1348/014466699164149

Thaler, R. H., & Sunstein, C. R. (2009). *Nudge: improving decisions about health, wealth and happiness*. Camberwell, Vic: Penguin Group (Australia).

Thompson, W., & Dreyer, D. (2011). *Handbook of International Rivalries*. Washington: CQ Press.

Truelove, H. B., Carrico, A. R., Weber, E. U., Raimi, K. T., & Vandenbergh, M. P. (2014). Positive and negative spillover of pro-environmental behavior: An integrative review and theoretical framework. *Global Environmental Change, 29*, 127-138. doi:10.1016/j.gloenvcha.2014.09.004

Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. S. (1987). *Rediscovering the social group: A self-categorization theory*: Basil Blackwell.

Tversky, A., & Kahneman, D. (1974). Judgment under Uncertainty: Heuristics and Biases. *Science, 185*(4157), 1124-1131. doi:10.1126/science.185.4157.1124

Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science, 211*(4481), 453-458. doi:10.1126/science.7455683

Verplanken, B., Jetten, J., & Knippenberg, A. v. (1996). Effects of stereotypicality and perceived group variability on the use of attitudinal information in impression formation. *Personality and Social Psychology Bulletin, 22*(9), 960-971. doi:10.1177/0146167296229009

Wansink, B., Kent, R. J., & Hoch, S. J. (1998). An anchoring and adjustment model of purchase quantity decisions. *Journal of Marketing Research, 35*(1), 71-81. doi:10.2307/3151931

White, K. M., Hogg, M. A., & Terry, D. J. (2002). Improving Attitude-Behavior Correspondence Through Exposure to Normative Support From a Salient Ingroup. *Basic and Applied Social Psychology, 24*(2), 91-103. doi:10.1207/153248302753674604

Whitmarsh, L., & O'Neill, S. (2010). Green identity, green living? The role of pro-environmental self-identity in determining consistency across diverse pro-environmental behaviours. *Journal of Environmental Psychology, 30*(3), 305-314. doi:http://dx.doi.org/10.1016/j.jenvp.2010.01.003

Appendix A

Information and consent sheet

THE UNIVERSITY OF QUEENSLAND AUSTRALIA | School of Psychology

Information and Consent

Attitudes towards energy consumption

The purpose of the study

The purpose of this study is to examine attitudes towards energy consumption. This study is being conducted by [redacted] as part of the requirements for the [redacted] at the University of Queensland under the supervision of [redacted]

Participation and withdrawal
Participation in this study is completely voluntary and you are free to withdraw from this study at any time without prejudice or penalty. If you wish to withdraw, skip the questions, but ensure you go to the end of the survey to get your participation code (this is needed to receive payment).

What is involved?
Participants are asked to view an energy bill and complete a questionnaire about their energy consumption. Participation in this study will take approximately half an hour in total.

Risks
Participation in this study should involve no physical or mental discomfort, and no risks beyond those of everyday living. If, however, you should find any question or procedure to be invasive or offensive, you are free to omit answering or participating in that aspect of the study.

Confidentiality and security of data
All data collected in this study will be stored confidentially. Only members of the research team will have access to identified data. All data will be coded in a de-identified manner and subsequently analysed and reported in such a way that responses will not be able to be linked to any individual.

Ethics Clearance and Contacts
This study has been cleared in accordance with the ethical review processes of the University of Queensland and within the guidelines of the National Statement on Ethical Conduct in Human Research. You are, of course, free to discuss your participation with project staff [redacted]

If you would like to speak to an officer of the University not involved in the study, you may contact one of the School of Psychology Ethics Review Officers: Thomas Suddendorf (tsuddend@psy.uq.edu.au, Phone: 3365 8341), Jeanie Sheffield (jeanie@psy.uq.edu.au, Phone: 3365 6690), or Alex Haslam (uqshasla@uq.edu.au, Phone: 3346 7345) or Julie Henry (julie.henry@uq.edu.au, Phone: 3365 6737). Alternatively, you may leave a message with the School of Psychology Ethics Coordinator, Danico Jones at 3365 6448 for an ethics officer to contact you, or you may contact the University of Queensland Ethics Officer on 3365 3924, e-mail: humanethics@research.uq.edu.au

If you would like to learn the outcome of the study in which you are participating, you can contact me at the email above after 7 October, and I will send you an Abstract of the study and findings.

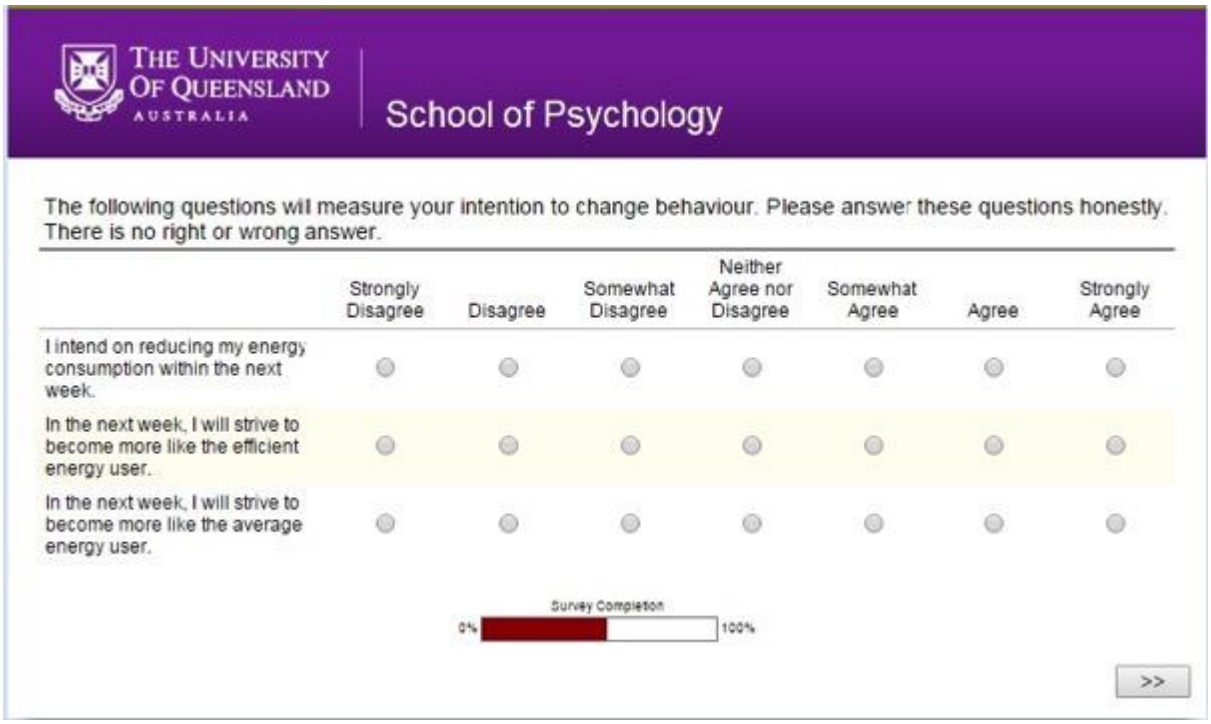
Thank you for your participation in this study.

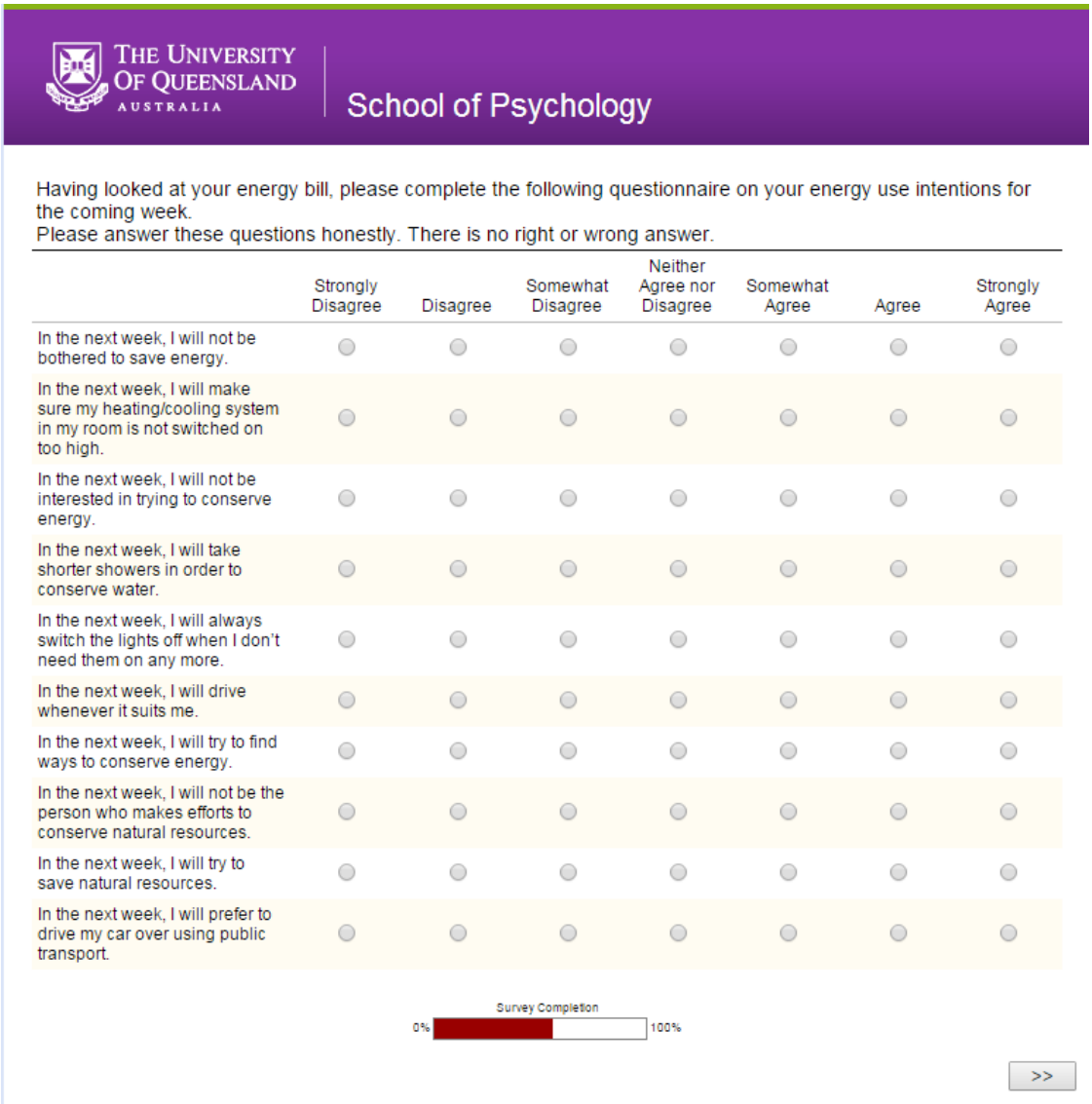
[redacted]

Please continue if you consent to taking part in this study.

Appendix B

Dependent measures and identification





THE UNIVERSITY OF QUEENSLAND
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School of Psychology

Having looked at your energy bill, please complete the following questionnaire on your energy use intentions for the coming week.
Please answer these questions honestly. There is no right or wrong answer.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
In the next week, I will not be bothered to save energy.	○	○	○	○	○	○	○
In the next week, I will make sure my heating/cooling system in my room is not switched on too high.	○	○	○	○	○	○	○
In the next week, I will not be interested in trying to conserve energy.	○	○	○	○	○	○	○
In the next week, I will take shorter showers in order to conserve water.	○	○	○	○	○	○	○
In the next week, I will always switch the lights off when I don't need them on any more.	○	○	○	○	○	○	○
In the next week, I will drive whenever it suits me.	○	○	○	○	○	○	○
In the next week, I will try to find ways to conserve energy.	○	○	○	○	○	○	○
In the next week, I will not be the person who makes efforts to conserve natural resources.	○	○	○	○	○	○	○
In the next week, I will try to save natural resources.	○	○	○	○	○	○	○
In the next week, I will prefer to drive my car over using public transport.	○	○	○	○	○	○	○

Survey Completion
0% 100%

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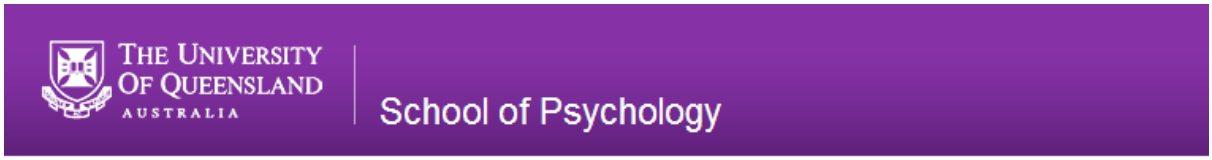
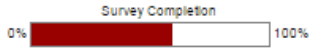


Please answer the following questions honestly. There is no right or wrong answer.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
I identify with people who live in the United States of America.	○	○	○	○	○	○	○
I feel committed to people who live in United States of America.	○	○	○	○	○	○	○
I am glad to be a person who lives in the United States of America.	○	○	○	○	○	○	○
Being a person who lives in the United States of America is an important part of how I see myself.	○	○	○	○	○	○	○
I identify with people who live in Canada.	○	○	○	○	○	○	○
I feel committed to people who live in Canada.	○	○	○	○	○	○	○



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Appendix C

Energy savings brochure

THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

School of Psychology

12 practical ways to save energy in your home

1. Adjust your thermostat
Every 1°C higher for heating and 1°C lower for cooling adds 10% to the running costs of your appliance.

2. Reduce the area you heat or cool
Close off rooms you are not using to save on heating and cooling, unless you are using whole-of-home ducted evaporative cooling.

3. Make the most of free heating and cooling
Use the sun to heat your home for free in winter by opening curtains and blinds. In summer, shade windows and use natural breezes to keep your home cool.

4. Take shorter showers
Use a shower timer to help you keep your showers to 4 minutes or less.

5. Install an efficient shower head
This could save at least 10 litres of hot water every minute!

6. Know how much your appliances cost to run
Running costs add up. Some portable heaters could cost hundreds of dollars a month to run. Find out more at sa.gov.au/energy/runningcosts

7. Wash clothes in cold water
Washing machines use energy to heat water. Save by using detergents that work well with cold water.

8. Check fridge and freezer temperatures
Set your fridge to between 3°C and 5°C and your freezer to between -15°C and -18°C to save energy.

9. Turn off second fridges and freezers when not required
Save by turning off second fridges when you're not using them.

10. Turn off lights
Make it a habit to turn off lights when you leave a room.

11. Use the microwave instead of the oven
Microwaves and smaller kitchen appliances use less energy than the oven.

12. Switch off appliances rather than using stand-by
Stand-by power adds to your energy costs, switch off at the wall to save.

Choose energy efficient appliances

Water heaters, heaters and cooling appliances such as air conditioners are major users of energy in the home and last for many years.

Consider the ongoing running costs as well as the purchase price when choosing. Most energy efficient models will cost you less over the life of the appliance.

Look for the energy star rating label to help you. Find out more at energyrating.gov.au

Can your organisation help to promote energy efficiency?

Visit sa.gov.au/energypartners to find out.

Timing

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Last Click	0 seconds
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Appendix D

Demographics

Age (in years)

Gender

- Male
- Female

Ethnicity (e.g. Hispanic American, Asian American, African American)

Nationality (e.g. US Citizen, Canadian Citizen)

How many people in your current household (including yourself)?

- 1
- 2
- 3
- 4
- 5+

Current city or town you are living in (e.g. Los Angeles, Des Moines, New York City, etc)?

Appendix E

Debrief and validation code

Debrief

Thank you for completing the questionnaires on attitudes towards energy consumption. We are now able to tell you a little more about the research.

Nudges have been used to influence pro-social behaviour such as healthier lifestyle choices, charity donation, and retirement savings (John, 2011). A nudge (or liberal paternalism) is defined as any aspect of choice architecture that influences people's behaviour without restricting choices or significantly changing economic incentive (Thaler and Sustein, 2008). There has been limited experimental research on nudges and some argue that its effects are small and do not have long lasting behavioural change (Mols, Haslam, Jetten, & Steffens, 2015). Previous literature (Mols et al., 2015) has suggested that social identity based approaches are more effective in maintain longer lasting behaviour change, as people's behaviours are influenced by the behaviours of others (particularly if they highly identify with the norm).

The current research is investigating whether a nudge can effectively change behaviour. We predict that when people are exposed to a nudge, they are more likely to change their behaviour. Furthermore, when a nudge is paired with social identity (particularly if it there is high identification), we predict that the nudge should be more effective and should have longer lasting effects.

In this study, participants were randomly assigned to one of four conditions: 1) Nudge – presented with an electricity bill that showed above average use compared to the norm average; 2) Nudge + low social identity – norm average group is an out-group; 3) Nudge + high social identity – norm group is an in-group; 4) Control – no feedback about norm average group.

If you would like to learn more about these topics, you can refer to the following resources:

Costa, D. L., & Kahn, M. E. (2013). Energy conservation "nudges" and environmentalist ideology: Evidence from a randomized residential electricity field experiment. *Journal of the European Economic Association, 11*(3), 680-702. doi: 10.1111/jeea.12011.

Mols, F., Haslam, S. A., Jetten, J., & Steffens, N. K. (2015). Why a nudge is not enough: A social identity critique of governance by stealth. *European Journal of Political Research*, 54(1), 81-98. doi:10.1111/1475-6765.12073.

Thaler, R. & C. Sunstein (2008) *Nudge: Improving decisions about health, wealth and happiness*. London: Penguin.

If you would like to learn the outcome of the study in which you are participating, you can contact me via email [redacted] after 7 October 2015, and I will send you an abstract of the study and findings.

Thank you for your participation in this study.

[redacted]

Please continue to receive your validation code to receive payment for participating in this survey.

Appendix F

Study 1: ANOVA output – intentions (including American and Canadian identification)

Tests of Between-Subjects Effects

Dependent Variable: intention

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	20.616[a]	3	6.872	5.187	.002
Intercept	11341.566	1	11341.566	8561.585	.000
Condition	20.616	3	6.872	5.187	.002
Error	498.089	376	1.325		
Total	12059.583	380			
Corrected Total	518.704	379			

Tests of Between-Subjects Effects

Dependent Variable: intention

Source	Partial Eta Squared
Corrected Model	.040
Intercept	.958
Condition	.040
Error	
Total	
Corrected Total	

a. R Squared = .040 (Adjusted R Squared = .032)

Estimates

Dependent Variable: intention

Condition	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
1	5.616	.116	5.387	5.844
2	5.543	.112	5.322	5.764

3	5.727	.117	5.497	5.957
4	5.079	.129	4.826	5.332

Pairwise Comparisons

Dependent Variable: intention

(I) Condition	(J) Condition	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b] Lower Bound
1	2	.073	.162	.653	-.245
	3	-.111	.165	.501	-.435
	4	.536*	.173	.002	.195
2	1	-.073	.162	.653	-.391
	3	-.184	.162	.257	-.503
	4	.464*	.171	.007	.128
3	1	.111	.165	.501	-.213
	2	.184	.162	.257	-.135
	4	.648*	.174	.000	.306
4	1	-.536*	.173	.002	-.877
	2	-.464*	.171	.007	-.800
	3	-.648*	.174	.000	-.989

Pairwise Comparisons

Dependent Variable: intention

(I) Condition	(J) Condition	95% Confidence Interval for Difference Upper Bound
1	2	.391
	3	.213
	4	.877
2	1	.245
	3	.135
	4	.800
3	1	.435
	2	.503
	4	.989
4	1	-.195

2	-.128
3	-.306

Based on estimated marginal means
*. The mean difference is significant at the .05 level.
b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

Univariate Tests

Dependent Variable: intention

	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Contrast	20.616	3	6.872	5.187	.002	.040
Error	498.089	376	1.325			

The F tests the effect of Condition. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

American Identification

Descriptive Statistics

Dependent Variable: intention

Condition	Mean	Std. Deviation	N
1	5.6156	1.10953	98
2	5.5429	1.24143	105
3	5.7268	.94959	97
4	5.0792	1.29180	80
Total	5.5110	1.16988	380

Tests of Between-Subjects Effects

Dependent Variable: intention

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	28.787[a]	4	7.197	5.509	.000	.055
Intercept	361.713	1	361.713	276.868	.000	.425
amid	8.171	1	8.171	6.254	.013	.016
Condition	21.325	3	7.108	5.441	.001	.042

Error	489.918	375	1.306			
Total	12059.583	380				
Corrected Total	518.704	379				

a. R Squared = .055 (Adjusted R Squared = .045)

Estimates

Dependent Variable: intention

Condition	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
1	5.621[a]	.115	5.394	5.848
2	5.528[a]	.112	5.309	5.748
3	5.739[a]	.116	5.510	5.967
4	5.077[a]	.128	4.825	5.328

a. Covariates appearing in the model are evaluated at the following values: amid = 5.5851.

Pairwise Comparisons

Dependent Variable: intention

(I) Condition	(J) Condition	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]
					Lower Bound
1	2	.093	.161	.564	-.223
	3	-.118	.164	.473	-.440
	4	.544*	.172	.002	.206
2	1	-.093	.161	.564	-.409
	3	-.210	.161	.193	-.528
	4	.452*	.170	.008	.118
3	1	.118	.164	.473	-.204
	2	.210	.161	.193	-.107
	4	.662*	.173	.000	.322
4	1	-.544*	.172	.002	-.883
	2	-.452*	.170	.008	-.785
	3	-.662*	.173	.000	-1.002

Pairwise Comparisons

Dependent Variable: intention

(I) Condition	(J) Condition	95% Confidence Interval for Difference Upper Bound
1	2	.409
	3	.204
	4	.883
2	1	.223
	3	.107
	4	.785
3	1	.440
	2	.528
	4	1.002
4	1	-.206
	2	-.118
	3	-.322

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

Univariate Tests

Dependent Variable: intention

	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Contrast	21.325	3	7.108	5.441	.001	.042
Error	489.918	375	1.306			

The F tests the effect of Condition. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

Canadian Identification

Tests of Between-Subjects Effects

Dependent Variable: intention

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	21.073[a]	4	5.268	3.970	.004
Intercept	2327.312	1	2327.312	1753.791	.000
canada	.457	1	.457	.345	.558
Condition	20.461	3	6.820	5.140	.002
Error	497.631	375	1.327		
Total	12059.583	380			
Corrected Total	518.704	379			

Tests of Between-Subjects Effects

Dependent Variable: intention

Source	Partial Eta Squared
Corrected Model	.041
Intercept	.824
canada	.001
Condition	.039
Error	
Total	
Corrected Total	

a. R Squared = .041 (Adjusted R Squared = .030)

Estimates

Dependent Variable: intention

Condition	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
1	5.616[a]	.116	5.387	5.844
2	5.544[a]	.112	5.323	5.766
3	5.724[a]	.117	5.494	5.955
4	5.080[a]	.129	4.827	5.333

a. Covariates appearing in the model are evaluated at the following values: canada = 3.0158.

Pairwise Comparisons

Dependent Variable: intention

(I) Condition	(J) Condition	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b] Lower Bound
1	2	.071	.162	.660	-.247
	3	-.109	.165	.510	-.433
	4	.536*	.174	.002	.194
2	1	-.071	.162	.660	-.389
	3	-.180	.162	.268	-.499
	4	.465*	.171	.007	.128
3	1	.109	.165	.510	-.216
	2	.180	.162	.268	-.139
	4	.644*	.174	.000	.302
4	1	-.536*	.174	.002	-.877
	2	-.465*	.171	.007	-.801
	3	-.644*	.174	.000	-.987

Pairwise Comparisons

Dependent Variable: intention

(I) Condition	(J) Condition	95% Confidence Interval for Difference Upper Bound
1	2	.389
	3	.216
	4	.877
2	1	.247
	3	.139
	4	.801
3	1	.433
	2	.499
	4	.987
4	1	-.194
	2	-.128
	3	-.302

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

Univariate Tests

Dependent Variable: intention

	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Contrast	20.461	3	6.820	5.140	.002	.039
Error	497.631	375	1.327			

The F tests the effect of Condition. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

Appendix G

Study 1: Regression analyses output

Descriptive Statistics

	Mean	Std. Deviation	N
intention	5.6709	1.03191	195
n	.4974	.50128	195
idcent	-.0646	1.22280	195
int	-.0449	.87678	195

Correlations

		intention	n	idcent	int
Pearson Correlation	intention	1.000	.054	.164	.013
	n	.054	1.000	-.021	-.052
	idcent	.164	-.021	1.000	.716
	int	.013	-.052	.716	1.000
Sig. (1-tailed)	intention	.	.227	.011	.430
	n	.227	.	.386	.237
	idcent	.011	.386	.	.000
	int	.430	.237	.000	.
N	intention	195	195	195	195
	n	195	195	195	195
	idcent	195	195	195	195
	int	195	195	195	195

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	int, n, idcent[b]	.	Enter

a. Dependent Variable: intention

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	.227[a]	.052	.037	1.01276	.052	3.469

Model Summary

Model	Change Statistics		
	df1	df2	Sig. F Change
1	3	191	.017

a. Predictors: (Constant), int, n, idcent

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.675	3	3.558	3.469	.017[b]
	Residual	195.905	191	1.026		
	Total	206.580	194			

a. Dependent Variable: intention
b. Predictors: (Constant), int, n, idcent

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.626	.102		54.965	.000
	n	.102	.145	.050	.705	.482
	idcent	.266	.085	.316	3.126	.002
	int	-.248	.119	-.211	-2.085	.038

a. Dependent Variable: intention

Study 1: Simple effects for condition 1 (nudge only)

Descriptive Statistics

	Mean	Std. Deviation	N
intention	5.6156	1.10953	98
idcent	-.0392	1.20656	98
Condition	1.00	.000	98

Correlations

		intention	idcent	Condition
Pearson Correlation	intention	1.000	.290	.
	idcent	.290	1.000	.
	Condition	.	.	1.000
Sig. (1-tailed)	intention	.	.002	.000
	idcent	.002	.	.000
	Condition	.000	.000	.
N	intention	98	98	98
	idcent	98	98	98
	Condition	98	98	98

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	idcent[b]	.	Enter

a. Dependent Variable: intention
b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	.290[a]	.084	.074	1.06746	.084	8.796

Model Summary

Model	Change Statistics		
	df1	df2	Sig. F Change
1	1	96	.004

a. Predictors: (Constant), idcent

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.023	1	10.023	8.796	.004[b]
	Residual	109.389	96	1.139		
	Total	119.412	97			

a. Dependent Variable: intention
b. Predictors: (Constant), idcent

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.626	.108		52.148	.000
	idcent	.266	.090	.290	2.966	.004

a. Dependent Variable: intention

Study 1: Simple effects for condition 3 (nudge with shared identity)

Descriptive Statistics

	Mean	Std. Deviation	N
intention	5.7268	.94959	97
idcent	-.0903	1.24474	97

Condition	3.00	.000	97

Correlations

		intention	idcent	Condition
Pearson Correlation	intention	1.000	.024	.
	idcent	.024	1.000	.
	Condition	.	.	1.000
Sig. (1-tailed)	intention	.	.408	.000
	idcent	.408	.	.000
	Condition	.000	.000	.
N	intention	97	97	97
	idcent	97	97	97
	Condition	97	97	97

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	idcent[b]	.	Enter

a. Dependent Variable: intention
b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	.024[a]	.001	-.010	.95430	.001	.055

Model Summary

Model	Change Statistics		
	df1	df2	Sig. F Change
1	1	95	.815

a. Predictors: (Constant), idcent

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.050	1	.050	.055	.815[b]
	Residual	86.516	95	.911		
	Total	86.566	96			

a. Dependent Variable: intention
b. Predictors: (Constant), idcent

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.728	.097		58.964	.000
	idcent	.018	.078	.024	.234	.815

a. Dependent Variable: intention

Appendix H

Study 2: ANOVA output - intentions (including American and Russian identification)

Tests of Between-Subjects Effects

Dependent Variable: intention

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	14.154[a]	3	4.718	2.788	.041
Intercept	6971.448	1	6971.448	4119.554	.000
Condition	14.154	3	4.718	2.788	.041
Error	433.224	256	1.692		
Total	7477.778	260			
Corrected Total	447.378	259			

Tests of Between-Subjects Effects

Dependent Variable: intention

Source	Partial Eta Squared
Corrected Model	.032
Intercept	.941
Condition	.032
Error	
Total	
Corrected Total	

a. R Squared = .032 (Adjusted R Squared = .020)

Estimates

Dependent Variable: intention

Condition	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
1	5.409	.160	5.094	5.724
2	4.954	.171	4.618	5.290
3	5.472	.168	5.141	5.803
4	4.991	.149	4.697	5.285

Pairwise Comparisons

Dependent Variable: intention

(I) Condition	(J) Condition	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b] Lower Bound
1	2	.455	.234	.053	-.006
	3	-.063	.232	.786	-.520
	4	.418	.219	.057	-.013
2	1	-.455	.234	.053	-.916
	3	-.518*	.240	.031	-.990
	4	-.037	.227	.870	-.484
3	1	.063	.232	.786	-.394
	2	.518*	.240	.031	.046
	4	.481*	.225	.033	.039
4	1	-.418	.219	.057	-.849
	2	.037	.227	.870	-.409
	3	-.481*	.225	.033	-.923

Pairwise Comparisons

Dependent Variable: intention

(I) Condition	(J) Condition	95% Confidence Interval for Difference Upper Bound
1	2	.916
	3	.394
	4	.849
2	1	.006
	3	-.046
	4	.409
3	1	.520
	2	.990
	4	.923
4	1	.013
	2	.484

3	-.039

Based on estimated marginal means
*. The mean difference is significant at the .05 level.
b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

Univariate Tests

Dependent Variable: intention

	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Contrast	14.154	3	4.718	2.788	.041	.032
Error	433.224	256	1.692			

The F tests the effect of Condition. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

American identification

Tests of Between-Subjects Effects

Dependent Variable: intention

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	25.262[a]	4	6.316	3.831	.005	.057
Intercept	242.440	1	242.440	147.076	.000	.368
amid	12.093	1	12.093	7.336	.007	.028
Condition	13.935	3	4.645	2.818	.040	.032
Error	417.046	253	1.648			
Total	7436.667	258				
Corrected Total	442.308	257				

a. R Squared = .057 (Adjusted R Squared = .042)

Estimates

Dependent Variable: intention

Condition	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
1	5.421[a]	.159	5.107	5.735

2	4.941[a]	.169	4.609	5.273
3	5.469[a]	.166	5.143	5.796
4	5.016[a]	.148	4.724	5.308

a. Covariates appearing in the model are evaluated at the following values: amid = 5.4913.

Pairwise Comparisons

Dependent Variable: intention

(I) Condition	(J) Condition	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b] Lower Bound
1	2	.480*	.232	.040	.023
	3	-.048	.230	.835	-.501
	4	.405	.218	.064	-.024
2	1	-.480*	.232	.040	-.938
	3	-.528*	.236	.026	-.994
	4	-.075	.225	.737	-.518
3	1	.048	.230	.835	-.405
	2	.528*	.236	.026	.063
	4	.453*	.222	.043	.015
4	1	-.405	.218	.064	-.834
	2	.075	.225	.737	-.367
	3	-.453*	.222	.043	-.891

Pairwise Comparisons

Dependent Variable: intention

(I) Condition	(J) Condition	95% Confidence Interval for Difference Upper Bound
1	2	.938
	3	.405
	4	.834
2	1	-.023
	3	-.063
	4	.367
3	1	.501

	2	.994
	4	.891
4	1	.024
	2	.518
	3	-.015

Based on estimated marginal means
*. The mean difference is significant at the .05 level.
b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

Univariate Tests

Dependent Variable: intention

	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Contrast	13.935	3	4.645	2.818	.040	.032
Error	417.046	253	1.648			

The F tests the effect of Condition. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

Russian identification

Tests of Between-Subjects Effects

Dependent Variable: intention

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	13.611[a]	4	3.403	2.008	.094
Intercept	1810.255	1	1810.255	1068.341	.000
russia	.442	1	.442	.261	.610
Condition	13.501	3	4.500	2.656	.049
Error	428.697	253	1.694		
Total	7436.667	258			
Corrected Total	442.308	257			

Tests of Between-Subjects Effects

Dependent Variable: intention

Source	Partial Eta Squared
Corrected Model	.031
Intercept	.809
russia	.001
Condition	.031
Error	
Total	
Corrected Total	

a. R Squared = .031 (Adjusted R Squared = .015)

Estimates

Dependent Variable: intention

Condition	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
1	5.407[a]	.161	5.089	5.725
2	4.955[a]	.171	4.619	5.292
3	5.479[a]	.169	5.147	5.811
4	5.010[a]	.151	4.713	5.308

a. Covariates appearing in the model are evaluated at the following values: russia = 2.1163.

Pairwise Comparisons

Dependent Variable: intention

(I) Condition	(J) Condition	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]
					Lower Bound
1	2	.451	.235	.056	-.012
	3	-.072	.233	.757	-.532
	4	.397	.221	.074	-.039
2	1	-.451	.235	.056	-.914
	3	-.524*	.240	.030	-.996
	4	-.055	.228	.811	-.504
3	1	.072	.233	.757	-.387
	2	.524*	.240	.030	.051

	4	.469*	.227	.040	.021
4	1	-.397	.221	.074	-.833
	2	.055	.228	.811	-.395
	3	-.469*	.227	.040	-.917

Pairwise Comparisons

Dependent Variable: intention

		95% Confidence Interval for Difference
(I) Condition	(J) Condition	Upper Bound
1	2	.914
	3	.387
	4	.833
2	1	.012
	3	-.051
	4	.395
3	1	.532
	2	.996
	4	.917
4	1	.039
	2	.504
	3	-.021

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

Univariate Tests

Dependent Variable: intention

	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Contrast	13.501	3	4.500	2.656	.049	.031
Error	428.697	253	1.694			

The F tests the effect of Condition. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

Appendix I

Study 2: Regression analyses output

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	int, n, idcent[b]	.	Enter

a. Dependent Variable: intention
b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.194[a]	.038	.014	1.25578

a. Predictors: (Constant), int, n, idcent

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.498	3	2.499	1.585	.197[b]
	Residual	190.816	121	1.577		
	Total	198.315	124			

a. Dependent Variable: intention
b. Predictors: (Constant), int, n, idcent

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.401	.156		34.574	.000
	idcent	-.046	.126	-.045	-.368	.714
	n	.066	.225	.026	.294	.769

int	.330	.183	.221	1.799	.074

a. Dependent Variable: intention

Study 2: Simple Effects for condition 1 (nudge only)

Descriptive Statistics

	Mean	Std. Deviation	N
intention	5.4051	1.32352	65
Condition	1.00	.000	65
idcent	-.0938	1.24522	65

Correlations

		intention	Condition	idcent
Pearson Correlation	intention	1.000	.	-.044
	Condition	.	1.000	.
	idcent	-.044	.	1.000
Sig. (1-tailed)	intention	.	.000	.365
	Condition	.000	.	.000
	idcent	.365	.000	.
N	intention	65	65	65
	Condition	65	65	65
	idcent	65	65	65

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	idcent[b]	.	Enter

a. Dependent Variable: intention
b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	.044[a]	.002	-.014	1.33272	.002	.120

Model Summary

Model	Change Statistics		
	df1	df2	Sig. F Change
1	1	63	.730

a. Predictors: (Constant), idcent

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.213	1	.213	.120	.730[b]
	Residual	111.896	63	1.776		
	Total	112.109	64			

a. Dependent Variable: intention
b. Predictors: (Constant), idcent

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.401	.166		32.578	.000
	idcent	-.046	.134	-.044	-.346	.730

a. Dependent Variable: intention

Study 2: Simple Effects for condition 3 (nudge with shared identity)

Descriptive Statistics

	Mean	Std. Deviation	N
intention	5.4722	1.20778	60

Condition	3.00	.000	60
idcent	.0183	1.22644	60

Correlations

		intention	Condition	idcent
Pearson Correlation	intention	1.000	.	.288
	Condition	.	1.000	.
	idcent	.288	.	1.000
Sig. (1-tailed)	intention	.	.000	.013
	Condition	.000	.	.000
	idcent	.013	.000	.
N	intention	60	60	60
	Condition	60	60	60
	idcent	60	60	60

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	idcent[b]	.	Enter

a. Dependent Variable: intention
b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	.288[a]	.083	.067	1.16649	.083	5.251

Model Summary

Model	Change Statistics		
	df1	df2	Sig. F Change
1	1	58	.026

a. Predictors: (Constant), idcent

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.145	1	7.145	5.251	.026[b]
	Residual	78.920	58	1.361		
	Total	86.065	59			

a. Dependent Variable: intention
b. Predictors: (Constant), idcent

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.467	.151		36.299	.000
	idcent	.284	.124	.288	2.291	.026

a. Dependent Variable: intention